Levin-Richmond Terminal Corporation
402 Wright Avenue, Richmond, California 94804
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September 30, 2019

Ms. Karen Jurist
United States Environmental Protection Agency Region 9
75 Hawthorne Street
San Francisco, California 94105
Via email: jurist.karen@epa.gov

RE: 2018-2019 Annual Report, United Heckathorn Superfund Site, Upland Capping System
Richmond, California

Dear Ms. Jurist:

Enclosed please find the 2018-2019 Annual Report for the Upland Capping System at the United Heckathorn Superfund Site.

Please feel free to contact me if you have any questions or concerns with the attached report.

Sincerely,

James Holland
Vice President of Facilities, Equipment, and Environmental Officer
Levin Richmond Terminal Corporation
(510) 307-4076

Enclosure: 2018-2019 Annual Report for United Heckathorn Superfund Site Upland Capping System

Environmental Science & Engineering
Construction • Development • Industrial • Municipal
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# 2018-2019 Annual Report

**United Heckathorn Superfund Site**
**Upland Capping System**
**Richmond, California**

September 30, 2019
Rev. 0

*prepared for:*

**Levin Richmond Terminal Corporation**
402 Wright Avenue
Richmond, California 94804

*prepared by:*

**CDIM Engineering, Inc.**
45 Polk Street, 3rd Floor
San Francisco, California 94102

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**Richmond, California**

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*prepared by:*

**CDIM Engineering, Inc.**
45 Polk Street, 3rd Floor
San Francisco, CA 94102

CDIM's work for the Levin Richmond Terminal Corporation was conducted under my supervision. To the best of my knowledge, the data contained herein are true and accurate, are based on what can be reasonably understood as a result of this project, and satisfy the scope of work prescribed by the client for this project. The data, findings, recommendations, specifications, or professional opinions were prepared solely for the use of the Levin Richmond Terminal Corporation in accordance with generally accepted processional engineering and geologic practice. We make no other warranty, either expressed or implied, and are not responsible for the interpretation by others of the contents herein.

REGISTERED PROFESSIONAL ENGINEER
SCOTT A. BOURNE
C72817
EXP. 6/30/20
Scott Bourne
CIVIL
STATE OF CALIFORNIA

Scott Bourne

September 30, 2019

Scott Bourne, PE #C72817 Date
Principal Engineer

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BMP | best management practices |
| CDIM | CDIM Engineering, Inc. |
| DDD | dichlorodiphenyldichloroethane |
| DDE | dichlorodiphenyldichloroethene |
| DDT | dichlorodiphenyltrichloroethane |
| EPA | United States Environmental Protection Agency |
| gpm | gallons per minute |
| Heckathorn Site or Site | United Heckathorn Superfund Site |
| IGP | Storm Water Industrial General Permit |
| LRT | Levin Richmond Terminal |
| LRTC | Levin Richmond Terminal Corporation |
| MDL | method detection limit |
| msl | mean sea level |
| NAL | numeric action level |
| NPDES | National Pollutant Discharge Elimination System |
| O&G | oil and grease |
| O&M | operations and maintenance |
| O&M Plan | Revised Draft Operations and Maintenance Plan, Upland Capping System, Former United Heckathorn Site |
| pg/L | picograms per liter |
| QSE | Qualified Storm Event |
| ROD | Record of Decision |
| SWPPP | Storm Water Pollution Prevention Plan |
| SWRCB | State Water Resource Control Board |
| Third Five-Year Review | Third Five-Year Review Report for United Heckathorn Superfund Site, Richmond, California |
| TS-2 | advanced storm water treatment system TS-2 |
| TSS | total suspended solids |

# 1 INTRODUCTION

On behalf of the Levin Richmond Terminal Corporation (LRTC), CDIM Engineering, Inc. (CDIM) has prepared this 2018-2019 Annual Report to describe the inspection, monitoring, and maintenance performed on the upland cap at the United Heckathorn Superfund Site (Heckathorn Site).

## 1.1 Background

From 1947 through 1966, the Heckathorn Site was used for formulating, processing, packaging, and shipping pesticides including aldrin, dichlorodiphenyltrichloroethane (DDT), dieldrin, and endrin. These activities resulted in the release of pesticides to the surrounding soils and the Lauritzen Channel. In 1994, after remedial investigation and feasibility studies were completed, the United States Environmental Protection Agency (EPA) adopted a Record of Decision (ROD) for remedial action requiring:

- Dredging of all soft bay mud from the Lauritzen Channel and the Parr Canal, with offsite disposal of dredged material;
- Placement of clean material after dredging;
- Construction of a cap at and around the former Heckathorn facility to prevent erosion;
- A deed restriction limiting the property at the former Heckathorn facility location to non-residential uses; and,
- Marine monitoring to verify the effectiveness of the remedy (EPA, 1994b).

In 1996, LRTC entered a Consent Decree[1] with the EPA, which outlined LRTC's responsibility to design, construct, and maintain a concrete cap at and around the former Heckathorn facility to prevent erosion (United States District Court, 1996a). LRTC completed construction of the concrete cap in July 1999 (PES, 1999b).

Since the cap was constructed, EPA has completed four five-year reviews. EPA has found the upland remedial action is functioning as intended, is protective of human health and the environment, and has met the remedial action objective for the upland area by capping of contaminated soils, which has eliminated human exposure pathways and has prevented erosion (EPA, 2016a) [2].

[1] Montrose Chemical Corporation of California, Chris-Craft Industrial, Rhone-Poulenc, Inc. and Stauffer Management Company (collectively the "Montrose Group") entered into a separate Consent Decree with EPA for dredging of young bay mud from the Lauritzen Channel and Parr Canal, with offsite disposal of dredged material and placement of clean fill after dredging (United States District Court, 1996b).

[2] Specifically, the 2016 Five Year Review states (page 34) "*Another remedial action objective is to prevent the erosion and transport or upland soils into the Lauritzen Channel. Erosion is occurring only within the marine area – specifically, under the sheet pile along the Lauritzen Channel embankment; no erosion has been observed in the area of the upland cap. This RAO for the upland area has been met.*"

## 1.2 Program Objectives

To ensure long-term protection of human health and the environment, the remedial action goal established by the EPA for upland and embankment soils is the prevention of erosion and transport into the Lauritzen Channel (EPA, 1994a).

The upland cap was designed to prevent the release of residual chlorinated pesticides that are present in soils (PES, 1998).

The objective of the cap inspection and storm water monitoring programs is to identify any potential release of pesticide-impacted soil by examining the integrity of the cap system through visual inspection and storm water monitoring (EPA, 2011).

## 1.3 Operation and Maintenance Program

LRTC performs operations and maintenance (O&M) activities in accordance with the Revised Draft Operations and Maintenance Plan, Upland Capping System, Former United Heckathorn Site (O&M Plan; PES, 1999a). LRTC performs additional O&M activities as recommended by EPA in the Third Five-Year Review Report for United Heckathorn Superfund Site, Richmond, California (Third Five-Year Review; EPA, 2011) to provide added confidence that the upland area remedy maintains its effectiveness.

## 1.4 Contents of this Report

This Annual Report describes activities performed by LRTC to inspect, monitor and maintain the upland cap for the period of July 1, 2018 to June 30, 2019. Included is a summary of each of the following:

- Capping system maintenance activities;
- Storm water collection system inspection and cleaning;
- Storm water system monitoring;
- Storm water treatment;
- Annual cap inspection;
- Proposed site work for 2019-2020; and,
- A conclusion with CDIM's opinion as to the overall condition and effectiveness of the cap in meeting the program objectives.

# 2 SITE DESCRIPTION

The Levin Richmond Terminal (LRT) is located at 402 Wright Avenue in Richmond, California and is immediately adjacent to the Lauritzen Channel in the Richmond Harbor (Figure 1). The Heckathorn Site includes the northern five acres of the Main Terminal at LRT, also known as the upland cap area (Figure 2).

## 2.1 Upland Area Description and Current Use

The upland cap area is bounded by a railroad track and Cutting Boulevard to the north; South Fourth Street to the east; the LRT and Santa Fe Channel to the south; and, the Lauritzen Channel to the west. The majority of the upland cap area is relatively flat with surface elevations of approximately 9 feet above mean sea level (msl), with the exception of the upland cap area north of the Lauritzen Channel; this portion was raised to approximately 15 feet above msl during cap construction.

The upland cap area is used primarily for storage of dry bulk product and railroad operations. Photographs taken during the site inspection are included in Appendix A.

## 2.2 Nearby Water Bodies

The storm water system in the upland cap area discharges directly to the Lauritzen Channel (Figure 2). The Lauritzen Channel is connected to the San Francisco Bay via the Santa Fe Channel and Richmond Inner Harbor.

## 2.3 Upland Area Cap

Construction of the concrete cap at the upland cap area began in July 1998, and it was completed in July 1999 (PES, 1999b). Installation of the cap consisted of: (1) site grading to promote surface runoff to the collection points; (2) installation of a drainage system to collect surface runoff, including best management practices (BMPs) for storm water pollution prevention; and (3) construction of a reinforced concrete cap in the majority of the 5-acre area and construction of a geotextile fabric and gravel cap in the railroad track area (Figure 2). The concrete cap consists of a minimum 6-inch thick concrete with a double layer of welded wire fabric reinforcement. The gravel cover consists of a geotextile fabric over a prepared subgrade. The geotextile fabric is covered by a 6-inch layer of gravel.

## 2.4 Storm Water Collection and Advanced Treatment

The facility is paved with asphalt and concrete and is graded to direct surface water runoff via sheet flow or shallow swales to drop inlets (Figure 3). The drop inlets drain to five below-grade interceptors[3] (SW-3 through SW-7) via underground pipe. The interceptors are equipped with compartments and steel baffles to allow the

[3] The interceptor design was based on a five-minute retention time during a 10-year, 24-hour storm event (PES, 1999a).

settling of sediments and separation of oil/grease and floatables. Each interceptor is also equipped with normally-closed gate valves at the effluent pipe, which can be opened during heavy rains to enable direct discharge to the Lauritzen Channel.

In 2015, LRTC modified[4] the upland cap area storm water collection system and installed an advanced storm water treatment system TS-2 (TS-2). Single-speed submersible pumps placed into the final chamber of each interceptor were connected to newly installed storm drain pipe along the edge of the LRTC pier. During storm events, the submersible pumps push storm water captured by interceptors SW-3 to SW-7 through an inline static mixer where a biopolymer flocculant is added. Storm water then flows into a series of two 21,000-gallon aboveground clarification tanks, where flocculant and solids separate from the water. Storm water overflows from the second clarifier and is pumped through four, 48-inch diameter sand filters. Effluent from the treatment system then is discharged to the Lauritzen Channel at the interceptor SW-5 outfall. TS-2 is equipped with a variable speed drive for pump control, a programmable logic controller, and a human machine interface.

The estimated flow for the SW-3 to SW-7 catchments that results from a 0.2 inch per hour design storm intensity[5] is approximately 500 gallons per minute (gpm). TS-2 is designed to treat approximately 650 gpm. Additionally, due to the storage volume provided by interceptors and clarifiers, the system is able to capture and treat periods of storm water flow in excess of 650 gpm before treatment bypass occurs.

[4] The storm water treatment system was described in the 2014-2015 annual report and a telephone conversation (December 26, 2014) and email correspondence (January 26, 2016) between Rachelle Thompson of EPA and Scott Bourne, formerly of Weiss Associates.

[5] Design criteria for flow-based treatment established in IGP (SWRCB, 2014).

# 3 OPERATION AND MAINTENANCE

This section describes the operation and maintenance activities performed by LRTC for the upland cap at the Heckathorn Site during the 2018-2019 reporting year. These activities included:

- Upland cap maintenance;
- Storm water collection system inspection and cleaning;
- Storm water monitoring; and,
- Storm water treatment and operation.

## 3.1 Upland Cap Maintenance

During the 2018-2019 reporting year, LRTC monitored the performance of the concrete cap and gravel cover in accordance with recommendations contained in the 2017-2018 Annual Report (CDIM, 2018). LRTC regularly monitored the cap and inspected cracks, seals, and joints for signs of propagation and/or degradation. No evidence of exposed underlying soil was observed. Deteriorating concrete and minor surficial cracks were addressed as described in Section 4.1 below. The upland cap functioned as designed, and no major maintenance or repair of the cap was conducted during the current reporting period.

LRTC repaired deteriorating concrete at the railroad track east of interceptor #5, which was identified for monitoring and potential repair in the 2017-2018 Annual Report (CDIM, 2018) (Appendix A; Photos 1a and 1b). LRTC also repaired deteriorating concrete along the southern border of the cap, west of SW-3 (Appendix A; Photos 2a and 2b). Repair work was performed during dry weather conditions and did not disturb underlying soil.

## 3.2 Storm Water Collection System Inspection and Cleaning

LRTC inspected the storm drain inlets, interceptors and clarifier tanks prior to the rainy season and monthly throughout the reporting year per its Storm Water Pollution Prevention Plan (SWPPP; CDIM, 2018). Storm water interceptors and the clarifier tanks were cleaned before the start of the rainy season. Drain inlets and inlet filters were cleaned and replaced as-needed throughout the year. Accumulated material that was removed from the inlets, interceptors and clarifier tanks appeared to be bulk product, which LRTC returned to the bulk product piles.

## 3.3 Storm Water Monitoring

The objective of the storm water monitoring program is to verify the cap is effectively preventing erosion, reducing the potential for storm water contact with soils containing residual pesticides and reducing the potential for release of residual pesticides to the Lauritzen Channel. This section describes the storm water sampling, results, and quality assurance/quality control procedures. It also includes an assessment of the results.

### 3.3.1 Storm Water Sampling

LRTC sampled industrial storm water discharges in accordance with State Water Resources Control Board (SWRCB) Water Quality Order No. 2014-0057-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001, *General Permit for Storm Water Discharges Associated with Industrial Activities* (IGP; SWRCB, 2014); the O&M Plan (PES, 1999a) and a Consent Decree between the San Francisco Baykeeper and the Levin Richmond Terminal Corporation (United States District Court, 2014).[6] Storm water monitoring requirements are documented in LRTC's SWPPP.

Prior to 2015, LRTC collected samples from interceptors SW-3 through SW-7. Since installing advanced treatment system TS-2, LRTC no longer regularly discharges storm water at these locations. As a result, LRTC now collects storm water samples from the TS-2 influent and effluent.[7] In the event that elevated pesticides are detected in the TS-2 influent or effluent, LRTC is prepared to sample at interceptors SW-3 through SW-7.

Storm water samples were submitted to Vista Analytical in El Dorado Hills, California for pesticide analysis by EPA Method 1699. Storm water samples were submitted to Pace Analytical National Laboratories in Mount Juliet, Tennessee for the following analyses: pH by Standard Method 4500HB, total suspended solids (TSS) by Standard Method 2540D, oil and grease (O&G) by EPA 1644A, and metals by EPA Method 200.8. Original laboratory reports, including applicable chain-of-custody forms, are included in Appendix B.[8]

### 3.3.2 Sample Results

During the 2018-2019 reporting year, storm water from the combined TS-2 influent and effluent was sampled during four storm events: November 27, 2018; December 5, 2018; January 11, 2019; and, January 31, 2019.

#### 3.3.2.1 Effluent Sample Results

Tables 1 and 2 show laboratory analytical results for pesticides and general parameters/metals, respectively. Pesticides were detected in the treated storm water discharge samples (TS2-E) from each of the four storm events sampled during the 2018-2019 reporting year. Total DDT[9] was detected at concentrations ranging from 262.8 to 11,234 picograms per liter (pg/L); dieldrin was detected at concentrations ranging from 787 to 1,540 pg/L. TS-2 discharge results for all other pollutants (metals, O&G pH and TSS) were below the numeric action levels (NALs; State Water Resources Control Board, 2014) during the 2018-2019 reporting year.

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[6] The Consent Decree between the San Francisco Baykeeper and the Levin Richmond Terminal Corporation expired on December 31, 2018.

[7] Changes to storm water monitoring was discussed during a telephone conversation on November 3, 2015 between Rachelle Thompson of EPA and Scott Bourne formerly of Weiss Associates.

[8] Laboratory analytical reports include data for LRT storm water discharge points that are not located in the upland cap area (TS1-E, TS3-E, TS4-E).

[9] Total DDT represents the sum of detected concentrations of 4,4' and 2,4'- isomers of DDT, DDD, and DDE and/or the detection limits for non-detected compounds.

#### 3.3.2.2 Influent Sample Results

Samples of the combined influent to TS-2 (TS2-I) were collected during each of the four storm events. Influent samples were composited using the SW-3, SW-4, and the combined SW-5/6/7 influent feeds; volume from each feed was calculated based on the estimated runoff contribution to TS-2 discharge. Total DDT was detected in the influent at concentrations ranging from 6,516 to 40,573 pg/L; dieldrin was detected at concentrations ranging from 945 to 3,670 pg/L.

### 3.3.3 Quality Assurance/Quality Control

The O&M Plan stipulates that at least one duplicate sample be collected for analysis by EPA Method 8080 per storm sampling event. However, due to the change to EPA Method 1699, it was determined that a duplicate pesticide sample was no longer necessary. EPA Method 1699 employs high-resolution gas chromatography/high-resolution mass spectrometry with isotope dilution and internal standard quantification techniques to provide improved sensitivity and data quality. In future years, a duplicate sample can be collected upon EPA request.

Laboratory method detection limits (MDLs) for each DDT isomer, and the sum of the MDLs for all DDT isomers, were below the total DDT final surface water remediation level of 590 pg/L established in the ROD (EPA, 1994b) for all events. The MDL for dieldrin was below the final surface water remediation level of 140 pg/L.

No data quality issues were reported through the data validation process. Based on the data validation process, the data resulting from sampling and analysis are acceptable and complete.

### 3.3.4 Assessment of Results

Pesticides were detected in all TS-2 influent and effluent samples during the 2018-2019 reporting year. Total DDT was detected in one of the four effluent samples at concentrations above the surface water remediation level of 590 pg/L. Dieldrin was detected in all four effluent samples at concentrations above the surface water remediation level of 140 pg/L. Figures 4 and 5 present trend charts showing influent and effluent DDT and dieldrin concentrations from October 2015 to present[10], including detected concentrations and MDLs when pesticides were not detected.[11] Sample results from the 2018-2019 reporting year show that TS-2 is effective at reducing concentrations of total DDT, dieldrin, TSS and metals. While concentrations show a relatively high degree of variability within a rain year and between rain years, both influent and effluent concentrations in 2018-2019 reporting year were generally consistent with concentrations from previous years.

## 3.4 Storm Water Treatment System Operation

LRT received approximately 26 inches of rainfall[12] during the 2018-2019 reporting period. According to the LRTC, TS-2 provided sufficient treatment capacity to prevent treatment system bypass for all time periods when its operation was observed. No significant operation and maintenance concerns were encountered.

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[10] Concentration trend charts for DDT and dieldrin for individual storm water discharge locations from 2011 to 2015 are contained in the 2014-2015 Annual Report (Weiss, 2015).

[11] Denoted by "<*n*", where *n* is MDL, if available, or reporting limit otherwise.

[12] Rainfall from LRTC rain gauge.

# 4 ANNUAL SITE INSPECTION

Representatives of LRTC and CDIM inspected the upland cap on May 29, 2019. The inspection included visual observations of the concrete cap, gravel cover, and drainage system throughout the observable extent of the upland cap area. Appendix A includes photographs taken during the inspections. Figure 3 shows the locations of the photographs. Appendix C includes the inspection form.

## 4.1 Concrete Cap Inspection

Visual inspections concentrated on identifying signs of deterioration and exposure of the underlying subgrade at cracks, joints, high-loading areas, gravel and cap penetrations. Areas identified in the Fourth Five-Year Review (EPA, 2016) and the 2017-2018 Annual Report (CDIM, 2018) with cracks and potential settlement were reexamined.

- **SW-3 Area** – No significant cracks or deterioration were noted in the SW-3 Area (Appendix A; Photo 3). Deteriorated concrete noted in the 2017-2018 Annual Report along the southern border of the cap, west of SW-3 was repaired (Appendix A; Photos 2a and 2b).
- **SW-4 Area** – Minor surficial cracks and seams were observed in the bulk product storage area (Appendix A; Photos 4 and 5). Planter boxes have been installed along the property boundary (Appendix A; Photo 6).
- **SW-5 Area** – No significant cracks or deterioration noted in the SW-5 Area (Appendix A; Photo 7). Settlement at the railroad track east of interceptor #5 (noted in the 2017-2018 annual report) was repaired (Appendix A; Photos 1a and 1b).
- **SW-6 Area** – No significant cracks or deterioration were noted in the concrete in the SW-6 Area (Appendix A; Photo 9).
- **SW-7 Area** – No significant cracks or deterioration were noted in the concrete in the SW-7 Area (Appendix A; Photo 10). Shotcrete applied to the northern shoreline of the Lauritzen Channel appeared to be in good condition (Appendix A; Photo 11)

No evidence of differential settling or vertical displacement was observed across the cap. No evidence of cracks, gaps, significant cap deterioration, or other material breach with apparent potential for exposure of the underlying subgrade was observed during the inspection. CDIM recommends that LRTC continue to monitor the cap for signs of deterioration.

## 4.2 Gravel Cover Inspection

Visual observations of the gravel cover concentrated on identifying areas where the gravel cover was thin. A geotextile membrane underlies the gravel cover, but it was not visually observed in any of the areas inspected. Below is a summary of observations from the concrete cap inspection.

- **SW-4 Area** – The gravel cover appeared adequate; the underlying geotextile fabric was not exposed in any area (Appendix A; Photos 6 and 13).
- **SW-5 Area** – The gravel cover appeared adequate; the underlying geotextile fabric was not exposed in any area (Appendix A; Photo 12).

- **SW-6 Area** – The gravel cover appeared adequate; the underlying geotextile fabric was not exposed in any area (Appendix A; Photo 14).

No visual evidence of differential settling or vertical displacement was observed. Overall, the gravel cover was found to be in good condition and functioning properly with no apparent potential for exposure of the underlying subgrade. CDIM recommends that LRTC continue to regularly inspect the gravel cover and to perform maintenance as detailed in Section 5.

# 5 PROPOSED SITE WORK FOR 2019-2020

During the 2019-2020 reporting year, O&M activities will continue as follows:

- Storm water discharge samples will be collected from the TS-2 treatment system effluent (combined SW-3 through SW-7) discharge location. TS-2 influent samples will also be collected to evaluate system effectiveness.
- An annual inspection of the concrete cap and gravel cover in the upland cap area will be performed in the early summer of 2020.
- Regular inspections of the upland capping system, including the drainage system, will continue as part of the SWPPP (CDIM, 2018) compliance activities and daily operations.
- As needed, significant cracks will be filled, and deteriorated sections of concrete in the upland capping system will be replaced.

Proposed site work under the O&M Plan for 2019-2020 is presented in Table 3.

Any repairs to the cap, if required, will be documented and reported in a memorandum to the EPA and the California Department of Toxic Substances Control.

# 6 CONCLUSIONS AND RECOMMENDATIONS

The annual upland capping system inspection found that the surface cap is in overall good condition, and it effectively functions to prevent erosion of the underlying soil. Storm water sampling results from the upland cap area indicate that treatment system TS-2 is effective in reducing the discharge of pesticides.

CDIM recommends continuing the following maintenance and monitoring activities:

- Continue to monitor gravel cover areas and add gravel as needed;
- As needed, fill any significant cracks and replace deteriorated sections of concrete in the upland capping system;
- Implement regular inspections and BMPs identified in LRTC's SWPPP (CDIM, 2018); and,
- Continue to monitor storm water for pesticides as described herein.

# 7 REFERENCES

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# TABLES

Table 1. 2018-2019 Annual Storm Water Sampling Data for Pesticides

Analytical results[a]

| Discharge Location | 2,4'-DDD | 4,4'-DDD | 2,4'-DDE | 4,4'-DDE | 2,4'-DDT | 4,4'-DDT | Total DDT | Aldrin | alpha-BHC | alpha-Chlordane | beta-BHC | cis-Nonachlor | delta-BHC | Dieldrin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L |
| **INFLUENT** | | | | | | | | | | | | | | |
| **TS2-I[b]** | | | | | | | | | | | | | | |
| 11/27/2018 | **1,200** | **2,260** | **44.7** | **985** | **356** | **1,670** | **6,516** | **17.2 J** | **20.5 J** | **1,800** | **67.9** | **79.0** | **5.93 J** | **3,370** |
| 12/5/2018 | **1,090** | **2,070** | **173.0** | **3,150** | **1,310** | **4,660** | **12,453** | <8.36 | **82.5** | **340** | **35.7 J** | <63.1 | <4.19 | **945** |
| 1/11/2019 | **4,960** | **10,400** | **693.0** | **9,860** | **3,860** | **10,800** | **40,573** | **43.8** | **51.0** | **2,820** | **69.6** | **294** | <11.7 | **3,670** |
| 1/31/2019 | **1,250** | **2,360** | **269.0** | **3,830** | **1,700** | **4,580** | **13,989** | **18.2 J** | **51.2** | **931** | **48.6** | **101** | <6.64 | **1,820** |
| **EFFLUENT** | | | | | | | | | | | | | | |
| **TS2-E[c]** | | | | | | | | | | | | | | |
| 11/27/2018 | **54.7** | **71.7** | <1.26 | **52.8** | **13.5 J** | **70.1** | **262.8 J** | <3.30 | **43.0** | **65.1** | **40.3** | <7.19 | <2.05 | **787** |
| 12/5/2018 | **75.3** | **106** | <4.17 | **62.9** | **36.0 J** | **87.4** | **367.6 J** | <5.62 | **70.2** | **130** | **55.7** | <45.4 | <2.20 | **1,080** |
| 1/11/2019 | **644** | **1,420** | **99.6** | **3,450** | **1,140** | **4,480** | **11,234** | <13.9 | **49.6** | **439** | **54.0** | <37.8 | **5.68 J** | **1,540** |
| 1/31/2019 | **83.1** | **112** | **7.56 J** | **142** | **61.8** | **182** | **588** | <7.88 | **19.7 J** | **148** | **49.2** | <13.0 | <3.33 | **1,060** |
| **Remediation Goal[d]** | | | | | | | 590 | | | | | | | 140 |

| Discharge Location | Endosulfan I | Endosulfan II | Endosulfan sulfate | Endrin | Endrin aldehyde | Endrin ketone | gamma-BHC (Lindane) | gamma-Chlordane | Heptachlor | Heptachlor epoxide[e] | Hexachlorobenzene | Methoxychlor | Mirex | Oxychlordane | trans-Nonachlor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L | pg/L |
| **INFLUENT** | | | | | | | | | | | | | | | |
| **TS2-I[b]** | | | | | | | | | | | | | | | |
| 11/27/2018 | <30.8 | <112 | <25.8 | **482** | **69.0 J** | **718** | **13.3 J** | **631** | <3.48 | **285** | **48.4 B** | <213 | <11.4 | **30.4 J** | **426** |
| 12/5/2018 | <42.0 | <218 | <219 | **308** | <120 | <429 | **62.1** | **269** | <7.83 | **257** | **510 B** | <528 | <94.6 | <26.5 | **140** |
| 1/11/2019 | <152 | <325 | <437 | **651** | <166 | <498 | **45.7** | **1,840** | **37.0 J** | **1,313** | **1,230 B** | <1,140 | <67.3 | <102 | **1,040** |
| 1/31/2019 | <41.2 | <108 | <248 | **411** | <110 | <320 | **56.8** | **608** | **16.8 J** | **1,062** | **1,030 B** | <3,050 | <58.5 | <26.3 | **319** |
| **EFFLUENT** | | | | | | | | | | | | | | | |
| **TS2-E[c]** | | | | | | | | | | | | | | | |
| 11/27/2018 | <15.0 | <24.0 | <10.7 | **271** | **50.5** | **495** | **30.3 J** | **34.1 J** | <2.33 | <81.5 | **12.6 J,B** | <6.75 | <5.25 | <13.1 | <11.9 |
| 12/5/2018 | <35.8 | <154 | <170 | **294** | <66.6 | **573** | **42.7** | <25.0 | <6.74 | <142.9 | **13.3 J,B** | <107 | <55.8 | <24.8 | <26.8 |
| 1/11/2019 | <57.0 | <53.1 | <65.0 | **597** | <29.5 | **545** | **36.2 J** | **311** | <5.23 | **512.8** | **106 B** | <147 | <10.0 | <44.5 | **173** |
| 1/31/2019 | <27.9 | <18.3 | <31.2 | **279** | <14.4 | **629** | **11.9 J** | **82.4** | <9.38 | **2,022** | **25.1 J,B** | <5.17 | <6.86 | <26.2 | <27.3* |
| **Remediation Goal[d]** | | | | | | | | | | | | | | | |

**Notes:**

Detected concentrations of pesticides are displayed in **bold**.

* Not detected; reported value is estimated maximum possible concentration.

[a] Laboratory method EPA 1699.

[b] TS2-I is the combined influent from interceptors SW-3 to SW-7 and does not represent discharge. It is used to evaluate TS-2 effectiveness.

[c] TS2-E is the effluent of treatment system TS-2, which treats storm water from interceptors SW-3 to SW-7. It represents facility discharge.

[d] Remediation goal from USEPA Superfund Record of Decision: United Heckathorn Co., October 1994, for surface waters in the Lauritzen, Santa Fe, and lower Richmond Inner Harbor Channels.

[e] Reported result is sum of detected cis- and trans-heptachlor epoxide concentrations.

**Acronyms/Abbreviations:**

< n =not detected above the sample-specific estimated detection limit

B = compound was also detected in laboratory method blank

D = sample diluted for analysis; concentration calculated value

J = concentration reported is an estimated value

pg/L = picograms per liter

USEPA = United States Environmental Protection Agency

Table 2. 2018-2019 Annual Storm Water Sampling Data for General Parameters and Metals

| Discharge Location | Notes | Analytical Parameters[a] | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pH | O&G (HEM) | | TSS | | Aluminum | | Copper | Iron | | Lead | | Zinc |
| | | - | mg/L | | mg/L | | µg/L | | µg/L | µg/L | | µg/L | | µg/L |
| **INFLUENT** | | | | | | | | | | | | | | |
| **TS2-I[b]** | | | | | | | | | | | | | | |
| 11/27/2018 | | 7.66 | <5.49 | | 7.2 | | 54 | J | 28.7 | 703 | | 1.66 | B | 38.9 |
| 12/5/2018 | | 7.87 | <5.49 | | 56 | | 592 | | 9.42 | **1,160** | | 9.87 | | 85.4 |
| 1/11/2019 | | 7.69 | <5.32 | | 77 | | 904 | | --- | **1,990** | | 21.3 | | 110 |
| 1/31/2019 | | 7.65 | <5.56 | | 55 | | 318 | | --- | 969 | | 8.89 | | 87.1 |
| **EFFLUENT** | | | | | | | | | | | | | | |
| **TS2-E[c]** | | | | | | | | | | | | | | |
| 11/27/2018 | | 7.61 | <5.44 | | 0.7 | J | 30 | J | 7.65 | 271 | | 2.07 | B | 77.6 |
| 12/5/2018 | | 7.97 | <5.26 | | 0.43 | J | 26.1 | J | 7.39 | 31 | J | 0.561 | J | 29.4 |
| 1/11/2019 | | 7.95 | <5.68 | | 4.8 | | 95.7 | J | --- | 169 | | 2.17 | | 36.9 |
| 1/31/2019 | | 7.86 | 1.01 | J | 0.8 | J | 41.3 | J | --- | 242 | | 0.966 | J | 61.7 |
| **2014 IGP Numeric Action Levels (NALs)[d]** | | 6.0-9.0[e] | 15 | | 100 | | 750 | | 33.2 | 1,000 | | 262 | | 260 |

**Notes:**

**Bold** values exceed 2014 IGP NALs listed at the bottom of the table.

[a] Laboratory Methods: pH by SM4500HB; TSS by SM2540D, O&G by EPA 1664A; metals by EPA 200.8.

[b] TS2-I is the combined influent from interceptors SW-3 to SW-7 and does not represent discharge. It is used to evaluate TS-2 effectiveness.

[c] TS2-E is the effluent of treatment system TS-2, which treats storm water from interceptors SW-3 to SW-7.

[d] Numeric Action Level (NAL) in 2014 General Permit for Storm Water Discharges Associated with Industrial Activities (2014 IGP). California State Water Resources Control Board, April 1, 2014. Annual average unless otherwise noted.

**Acronyms/Abbreviations:**

< *n* = not detected above the detection limit

B = analyte was present in the associated method blank

EPA = Environmental Protection Agency

IGP = Industrial General Permit

J = concentration reported is an estimated value

mg/L = milligrams per liter

NAL = numeric action level

O&G HEM = oil and grease, hexane extractable material

TSS = total suspended solids

ug/L = micrograms per liter

Table 3. Proposed Site Work for 2019-2020, Levin Richmond Terminal Corporation

| Aspect | Description | Anticipated Completion Date |
|---|---|---|
| General | Implement activities (i.e., cap maintenance, storm water monitoring, interceptor cleanout) described in the O&M Plan.[1] | Continuously |
| | Submit report of O&M performed for the period of July 1, 2019 to June 30, 2020. | On/around August 15, 2020 |
| Concrete Cap | Perform 2019-2020 annual inspection of the cap under oversight of a registered engineer. | June 1, 2020 |
| | Perform the third triennial survey of the upland cap area to monitor for differential settlement. | June 1, 2020 |
| | Monitor identified cracks, seals, and joints for signs of propagation and/or degradation throughout upland capping system. | Continuously |
| Gravel Cover | Monitor the gravel cover throughout the Upland Area for signs of thinning or ground exposure. | Continuously |
| Storm Water System | Continue to treat combined storm water pumped from interceptors SW-3, SW-4, SW-5, SW-6, and SW-7 at treatment system TS-2 using flocculation, settling, and filtration methods. | Continuously |

1. *Revised Draft Operations and Maintenance Plan, Upland Capping System, Former United Heckathorn Site,* PES Environmental, Inc., March 1999.

# FIGURES

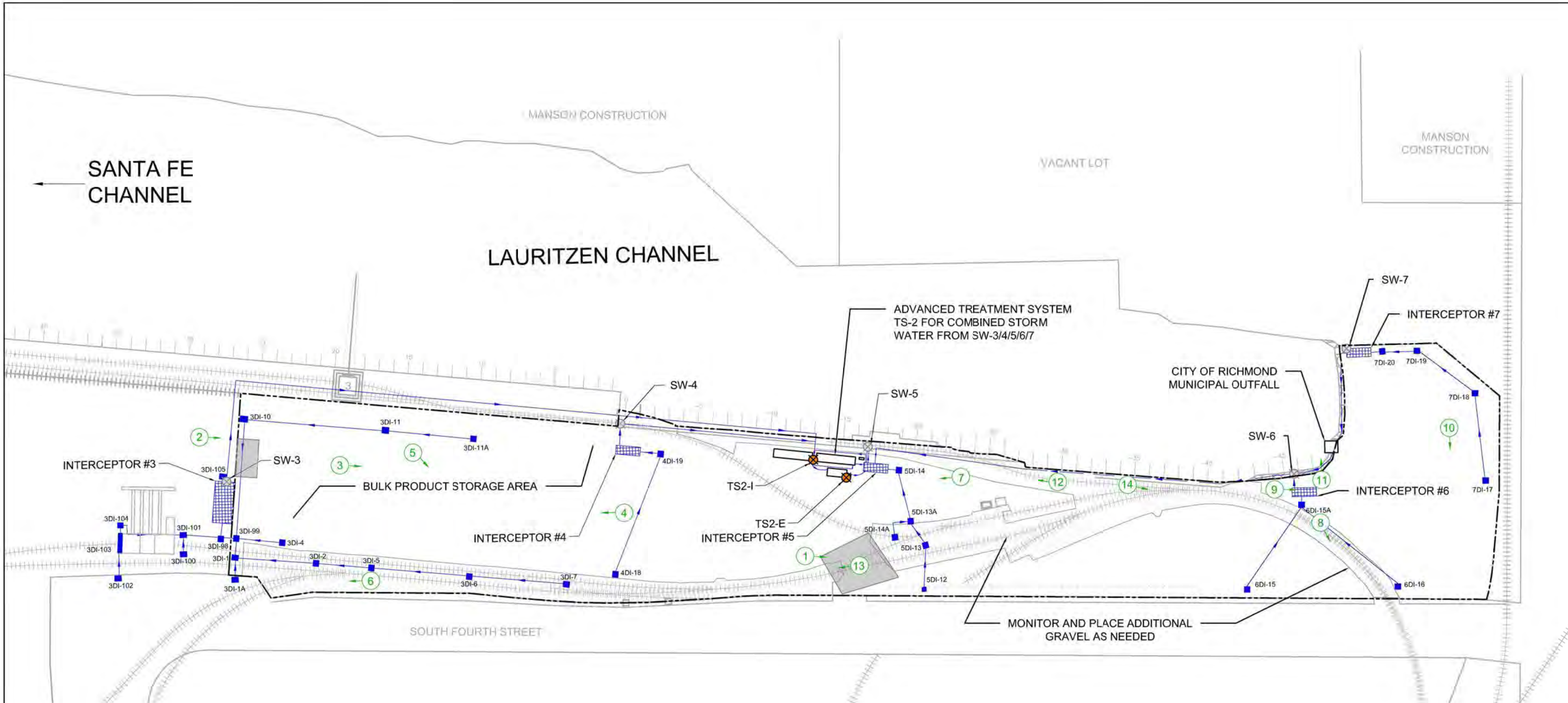

CDIM ENGINEERING

45 POLK STREET, THIRD FLOOR
SAN FRANCISCO, CA 94102
WWW.CDIMENGINEERING.COM
PH: (415) 498-0535

SITE LOCATION MAP
UNITED HECKATHORN SUPERFUND SITE
UPLAND CAPPING SYSTEM
RICHMOND, CALIFORNIA

FIGURE 1


| | | | |
|---|---|---|---|
| CDIM ENGINEERING | 45 POLK STREET, THIRD FLOOR<br>SAN FRANCISCO, CA 94102<br>WWW.CDIMENGINEERING.COM<br>PH: (415) 498-0535 | SITE LAYOUT<br>UNITED HECKATHORN SUPERFUND SITE<br>UPLAND CAPPING SYSTEM<br>RICHMOND, CALIFORNIA | FIGURE<br>2 |




LEGEND

- FENCELINE
- PHOTOGRAPH LOCATION (VIEW DIRECTION, NUMBER)
- CURRENT STORM WATER SAMPLING LOCATION
- HISTORICAL STORM WATER SAMPLING LOCATION
- SURFACE SWALE
- STORM DRAIN INLET
- BENT NUMBER
- GRAVEL COVER, LOCATION APPROXIMATE
- STORM WATER INTERCEPTOR
- STORM WATER PIPE
- 2018-2019 CONCRETE WORK, LOCATIONS APPROXIMATE
- UPLAND CAPPING SYSTEM BOUNDARY
- LAURITZEN CHANNEL SHORELINE
- RAIL LINE

N

0 100' 200'

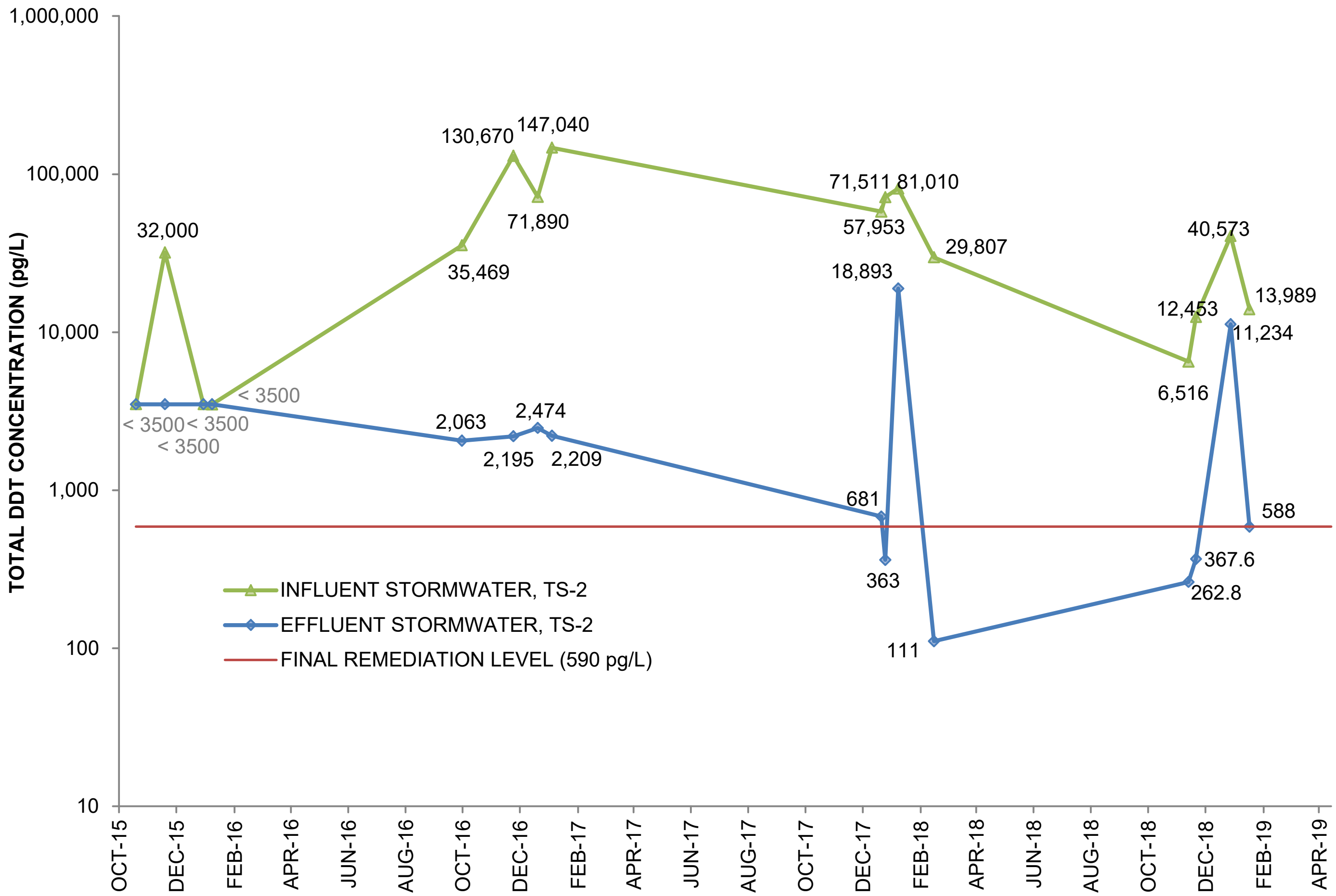
SCALE APPROXIMATE

NOTE: ALL LOCATIONS APPROXIMATE

CDIM ENGINEERING

UPLAND CAPPING SYSTEM DETAILS
UNITED HECKATHORN SUPERFUND SITE
RICHMOND, CALIFORNIA

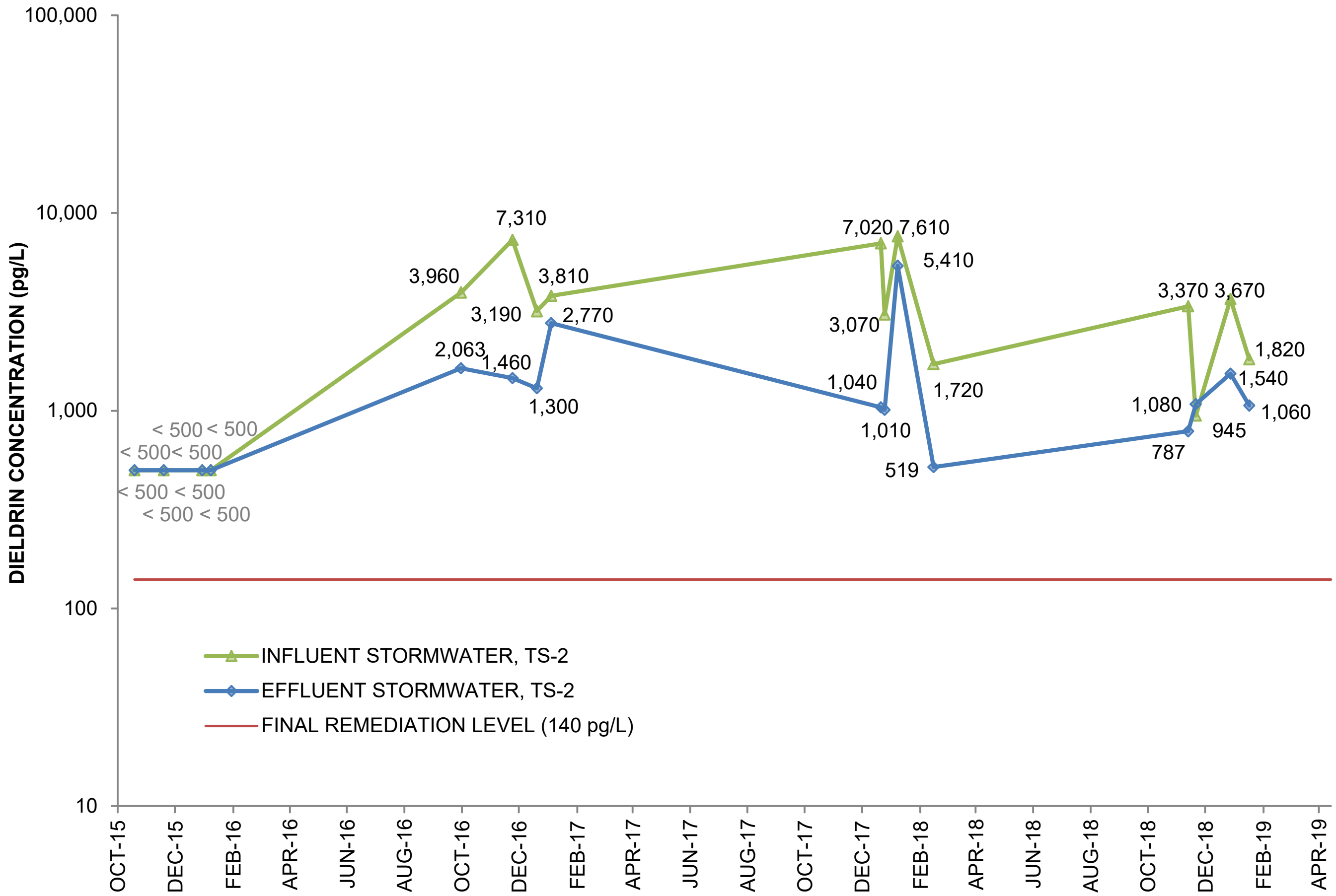
FIGURE 3




NOTES:

1. TOTAL DDT REPRESENTS THE SUM OF DETECTED DDT, DDD, AND DDE CONCENTRATIONS AND/OR DETECTION LIMITS FOR NON-DETECTED COMPOUNDS (DENOTED BY < N).
2. RESULTS REPORTED IN pg/L

| | | | |
|---|---|---|---|
| CDIM ENGINEERING | 45 POLK STREET, THIRD FLOOR<br>SAN FRANCISCO, CA 94102<br>WWW.CDIMENGINEERING.COM<br>PH: (415) 498-0535 | TOTAL DDT IN STORMWATER, 2015-2019<br>TREATMENT SYSTEM TS-2<br>UNITED HECKATHORN SUPERFUND SITE<br>UPLAND CAPPING SYSTEM<br>RICHMOND, CALIFORNIA | FIGURE<br>4 |




NOTES:
1. RESULTS REPORTED IN pg/L

| | | | |
|---|---|---|---|
| CDIM ENGINEERING | 45 POLK STREET, THIRD FLOOR<br>SAN FRANCISCO, CA 94102<br>WWW.CDIMENGINEERING.COM<br>PH: (415) 498-0535 | DIELDRIN IN STORMWATER, 2015-2019<br>TREATMENT SYSTEM TS-2<br>UNITED HECKATHORN SUPERFUND SITE<br>UPLAND CAPPING SYSTEM<br>RICHMOND, CALIFORNIA | FIGURE<br>5 |

# APPENDIX A

Upland Capping System Inspection Photographs

Photo 1a – Photo taken during the 2017-2018 Annual Upland Capping System Inspection. Deteriorated concrete was visible at railroad crossing. This photograph was taken prior to repairs.

Photo 1b – Photo taken during the 2018-2019 Annual Upland Capping System Inspection. Areas with deteriorating concrete noted in the 2017-2018 inspection have been repaired.

Photo 2a – Deteriorated concrete noted in the 2018-2019 Annual Upland Capping System Inspection, located south of the bulk storage area and east of SW-3. This photograph was taken prior to repairs.

Photo 2b – Area with deteriorated concrete noted in the 2018-2019 inspection have been repaired.

Photo 3 – Looking north at the area south of the secondary bulk product storage area. No significant cracking or deterioration is visible.

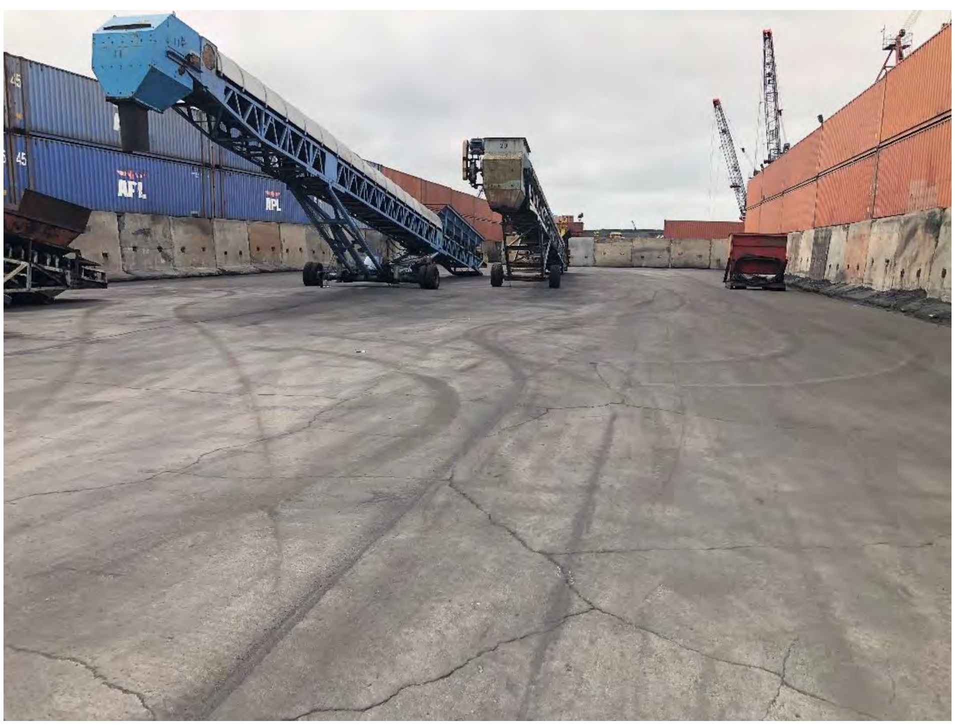


Photo 4 – Looking south: surficial cracking within secondary storage area.

Photo 5 – Looking northeast: seams and surficial cracking within secondary storage area.

Photo 6 – Gravel cover along the east border of the property. Planter boxes have been installed along the fence line.

Photo 7 – Looking south toward TS-2, no significant cracks or deterioration noted in the area.

Photo 8 – Looking northeast near northeast gate. No significant cracks or deterioration noted in the area. Gravel cover along railroad tracks appears adequate, with no underlying geotextile exposed.

Photo 9 – Looking north toward SW-6 no significant crack or deterioration noted in the area.

Photo 10 – Looking east at concrete cap north of the Lauritzen Channel. No significant cracks or deterioration noted in the area.

Photo 11 – Looking west toward the municipal outfall, at the north end of the Lauritzen Channel. Shotcrete has been applied to stabilize the area along the shoreline

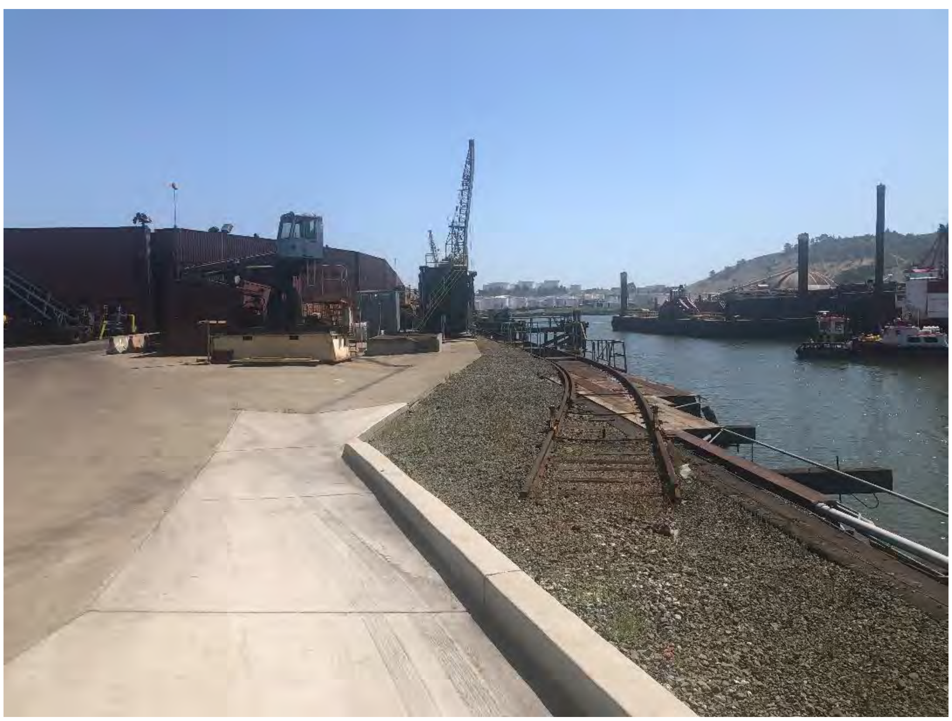


Photo 12 – Looking south: gravel cover is visible along the Lauritzen Channel north of TS-2.

Photo 13 – Looking south along eastern border of the site. Concrete repair work performed in 2018-2019 (see photo 1a and 1b) and the gravel cover that has been maintained along rail lines.

Photo 14 – Looking north at the concrete cap and gravel cover along Lauritzen Channel.

# APPENDIX B

Laboratory Analytical Reports

# ANALYTICAL REPORT

December 06, 2018

## CDIM Engineering - San Francisco, CA

| | |
|---|---|
| Sample Delivery Group: | L1048432 |
| Samples Received: | 11/30/2018 |
| Project Number: | 101-003, TASK 1 |
| Description: | LRTC 2018-2019 Industrial Stormwater |
| Site: | 402 WRIGHT AVE, RICHMOND, CA |
| Report To: | Mary Cunningham<br>45 Polk Street<br>3rd Floor<br>San Francisco, CA 94102 |

Entire Report Reviewed By:

Brian Ford
Project Manager



# TABLE OF CONTENTS

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## TS1-E-181127 L1048432-01 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 11/27/18 16:08 | 11/30/18 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1204187 | 1 | 12/03/18 14:09 | 12/03/18 15:03 | AJS |
| Wet Chemistry by Method 1664A | WG1205385 | 1 | 12/04/18 09:55 | 12/04/18 14:08 | ALA |
| Wet Chemistry by Method 4500H+ B-2011 | WG1204036 | 1 | 12/01/18 13:46 | 12/01/18 13:46 | KBW |
| Metals (ICPMS) by Method 200.8 | WG1204013 | 1 | 12/02/18 23:12 | 12/04/18 12:42 | LAT |

## TS2-E-181127 L1048432-02 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 11/27/18 16:39 | 11/30/18 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1204187 | 1 | 12/03/18 14:09 | 12/03/18 15:03 | AJS |
| Wet Chemistry by Method 1664A | WG1205385 | 1 | 12/04/18 09:55 | 12/04/18 14:08 | ALA |
| Wet Chemistry by Method 4500H+ B-2011 | WG1204036 | 1 | 12/01/18 13:46 | 12/01/18 13:46 | KBW |
| Metals (ICPMS) by Method 200.8 | WG1204013 | 1 | 12/02/18 23:12 | 12/04/18 13:51 | LAT |

## TS3-E-181127 L1048432-03 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 11/27/18 17:02 | 11/30/18 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1204187 | 1 | 12/03/18 14:09 | 12/03/18 15:03 | AJS |
| Wet Chemistry by Method 1664A | WG1205385 | 1 | 12/04/18 09:55 | 12/04/18 14:08 | ALA |
| Wet Chemistry by Method 4500H+ B-2011 | WG1204036 | 1 | 12/01/18 13:46 | 12/01/18 13:46 | KBW |
| Metals (ICPMS) by Method 200.8 | WG1204013 | 1 | 12/02/18 23:12 | 12/04/18 13:55 | LAT |

## TS4-E-181127 L1048432-04 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 11/27/18 17:15 | 11/30/18 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1204187 | 1 | 12/03/18 14:09 | 12/03/18 15:03 | AJS |
| Wet Chemistry by Method 1664A | WG1205385 | 1 | 12/04/18 09:55 | 12/04/18 14:08 | ALA |
| Wet Chemistry by Method 4500H+ B-2011 | WG1204036 | 1 | 12/01/18 13:46 | 12/01/18 13:46 | KBW |
| Metals (ICPMS) by Method 200.8 | WG1204013 | 1 | 12/02/18 23:12 | 12/04/18 13:59 | LAT |

## TSX-E-181127 L1048432-05 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 11/27/18 16:08 | 11/30/18 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1204187 | 1 | 12/03/18 14:09 | 12/03/18 15:03 | AJS |
| Wet Chemistry by Method 1664A | WG1205385 | 1 | 12/04/18 09:55 | 12/04/18 14:08 | ALA |
| Wet Chemistry by Method 4500H+ B-2011 | WG1204036 | 1 | 12/01/18 13:46 | 12/01/18 13:46 | KBW |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Project Manager

## Sample Handling and Receiving

**The following analysis were performed from an unpreserved, insufficiently or inadequately preserved sample.**

| Lab Sample ID | Project Sample ID | Method |
|---|---|---|
| L1048432-05 | TSX-E-181127 | 1664A |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 361 | 2580 | 1 | 12/03/2018 15:03 | WG1204187 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 806 | 5560 | 1 | 12/04/2018 14:08 | WG1205385 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.40 | T8 | 1 | 12/01/2018 13:46 | WG1204036 |

**Sample Narrative:**

L1048432-01 WG1204036: 7.4 at 18.2C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 20.6 | J | 20.0 | 100 | 1 | 12/04/2018 12:42 | WG1204013 |
| Iron | U | | 15.0 | 100 | 1 | 12/04/2018 12:42 | WG1204013 |
| Lead | 1.00 | B J | 0.260 | 1.00 | 1 | 12/04/2018 12:42 | WG1204013 |
| Zinc | 96.8 | | 1.91 | 10.0 | 1 | 12/04/2018 12:42 | WG1204013 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 700 | J | 350 | 2500 | 1 | 12/03/2018 15:03 | WG1204187 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 788 | 5440 | 1 | 12/04/2018 14:08 | WG1205385 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.61 | T8 | 1 | 12/01/2018 13:46 | WG1204036 |

**Sample Narrative:**

L1048432-02 WG1204036: 7.61 at 18.4C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 30.0 | J | 20.0 | 100 | 1 | 12/04/2018 13:51 | WG1204013 |
| Copper | 7.65 | | 0.270 | 1.00 | 1 | 12/04/2018 13:51 | WG1204013 |
| Iron | 271 | | 15.0 | 100 | 1 | 12/04/2018 13:51 | WG1204013 |
| Lead | 2.07 | B | 0.260 | 1.00 | 1 | 12/04/2018 13:51 | WG1204013 |
| Zinc | 77.6 | | 1.91 | 10.0 | 1 | 12/04/2018 13:51 | WG1204013 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 3000 | J P1 | 700 | 5000 | 1 | 12/03/2018 15:03 | WG1204187 |

**Sample Narrative:**

L1048432-03 WG1204187: Sample split with duplicate.

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 788 | 5440 | 1 | 12/04/2018 14:08 | WG1205385 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.30 | T8 | 1 | 12/01/2018 13:46 | WG1204036 |

**Sample Narrative:**

L1048432-03 WG1204036: 7.3 at 18.1C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 27.5 | J | 20.0 | 100 | 1 | 12/04/2018 13:55 | WG1204013 |
| Iron | 1520 | | 15.0 | 100 | 1 | 12/04/2018 13:55 | WG1204013 |
| Lead | 2.54 | B | 0.260 | 1.00 | 1 | 12/04/2018 13:55 | WG1204013 |
| Zinc | 68.9 | | 1.91 | 10.0 | 1 | 12/04/2018 13:55 | WG1204013 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 700 | J | 350 | 2500 | 1 | 12/03/2018 15:03 | WG1204187 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 788 | 5440 | 1 | 12/04/2018 14:08 | WG1205385 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.44 | T8 | 1 | 12/01/2018 13:46 | WG1204036 |

**Sample Narrative:**

L1048432-04 WG1204036: 7.44 at 17.6C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 58.8 | J | 20.0 | 100 | 1 | 12/04/2018 13:59 | WG1204013 |
| Iron | 71.0 | J | 15.0 | 100 | 1 | 12/04/2018 13:59 | WG1204013 |
| Lead | 1.67 | B | 0.260 | 1.00 | 1 | 12/04/2018 13:59 | WG1204013 |
| Zinc | 83.8 | | 1.91 | 10.0 | 1 | 12/04/2018 13:59 | WG1204013 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 1000 | J P1 | 700 | 5000 | 1 | 12/03/2018 15:03 | WG1204187 |

**Sample Narrative:**

L1048432-05 WG1204187: Sample split with duplicate.

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 1090 | J | 788 | 5440 | 1 | 12/04/2018 14:08 | WG1205385 |

**Sample Narrative:**

L1048432-05 WG1205385: Duplicate analysis could not be performed due to limited sample volume.

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.75 | T8 | 1 | 12/01/2018 13:46 | WG1204036 |

**Sample Narrative:**

L1048432-05 WG1204036: 7.75 at 17.4C

## Method Blank (MB)

(MB) R3365042-1 12/03/18 15:03

| Analyte | MB Result | MB Qualifier | MB MDL | MB RDL |
|---|---|---|---|---|
| | ug/l | | ug/l | ug/l |
| Suspended Solids | U | | 350 | 2500 |

## L1048432-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1048432-03 12/03/18 15:03 • (DUP) R3365042-3 12/03/18 15:03

| Analyte | Original Result | DUP Result | Dilution | DUP RPD | DUP Qualifier | DUP RPD Limits |
|---|---|---|---|---|---|---|
| | ug/l | ug/l | | % | | % |
| Suspended Solids | 3000 | 2400 | 1 | 22.2 | J P1 | 5 |

**Sample Narrative:**

OS: Sample split with duplicate.

## L1048432-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1048432-05 12/03/18 15:03 • (DUP) R3365042-4 12/03/18 15:03

| Analyte | Original Result | DUP Result | Dilution | DUP RPD | DUP Qualifier | DUP RPD Limits |
|---|---|---|---|---|---|---|
| | ug/l | ug/l | | % | | % |
| Suspended Solids | 1000 | 0.000 | 1 | 200 | P1 | 5 |

**Sample Narrative:**

OS: Sample split with duplicate.

## Laboratory Control Sample (LCS)

(LCS) R3365042-2 12/03/18 15:03

| Analyte | Spike Amount | LCS Result | LCS Rec. | Rec. Limits | LCS Qualifier |
|---|---|---|---|---|---|
| | ug/l | ug/l | % | % | |
| Suspended Solids | 773000 | 776000 | 100 | 85.0-115 | |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3365254-1 12/04/18 11:56

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| TPH - Oil & Grease | U | | 725 | 5000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365254-2 12/04/18 11:56 • (LCSD) R3365254-3 12/04/18 11:56

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 20000 | 17300 | 15600 | 86.5 | 78.0 | 64.0-132 | | | 10.3 | 18 |

## L1048183-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1048183-01 12/01/18 13:46 • (DUP) R3364437-3 12/01/18 13:46

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 9.77 | 9.73 | 1 | 0.410 | | 1 |

Sample Narrative:

OS: 9.77 at 19.6C

DUP: 9.73 at 18.8C

## L1048432-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1048432-05 12/01/18 13:46 • (DUP) R3364437-4 12/01/18 13:46

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 7.75 | 7.81 | 1 | 0.771 | | 1 |

Sample Narrative:

OS: 7.75 at 17.4C

DUP: 7.81 at 17.2C

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3364437-1 12/01/18 13:46 • (LCSD) R3364437-2 12/01/18 13:46

| Analyte | Spike Amount su | LCS Result su | LCSD Result su | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| pH | 10.0 | 10.0 | 10.1 | 100 | 101 | 99.0-101 | | | 0.398 | 1 |

Sample Narrative:

LCS: 10.04 at 19.7C

LCSD: 10.08 at 19.8C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3365145-1 12/04/18 12:14

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 |
| Copper | U | | 0.270 | 1.00 |
| Iron | U | | 15.0 | 100 |
| Lead | 0.351 | J | 0.260 | 1.00 |
| Zinc | U | | 1.91 | 10.0 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365145-2 12/04/18 12:18 • (LCSD) R3365145-3 12/04/18 12:22

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 4900 | 5080 | 98.0 | 102 | 85.0-115 | | | 3.51 | 20 |
| Copper | 50.0 | 48.8 | 49.5 | 97.6 | 99.1 | 85.0-115 | | | 1.47 | 20 |
| Iron | 5000 | 4840 | 4870 | 96.7 | 97.4 | 85.0-115 | | | 0.738 | 20 |
| Lead | 50.0 | 48.1 | 48.0 | 96.3 | 96.0 | 85.0-115 | | | 0.327 | 20 |
| Zinc | 50.0 | 49.2 | 49.5 | 98.3 | 99.1 | 85.0-115 | | | 0.764 | 20 |

## L1048417-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1048417-04 12/04/18 12:26 • (MS) R3365145-5 12/04/18 12:34 • (MSD) R3365145-6 12/04/18 12:38

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 95.7 | 5160 | 5280 | 101 | 104 | 1 | 70.0-130 | | | 2.25 | 20 |
| Copper | 50.0 | 81.2 | 126 | 127 | 90.2 | 91.0 | 1 | 70.0-130 | | | 0.302 | 20 |
| Iron | 5000 | 230 | 4860 | 4930 | 92.5 | 94.0 | 1 | 70.0-130 | | | 1.56 | 20 |
| Lead | 50.0 | 5.65 | 54.3 | 53.5 | 97.3 | 95.7 | 1 | 70.0-130 | | | 1.52 | 20 |
| Zinc | 50.0 | 73.9 | 124 | 123 | 99.6 | 97.4 | 1 | 70.0-130 | | | 0.899 | 20 |

## L1048432-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1048432-01 12/04/18 12:42 • (MS) R3365145-7 12/04/18 12:46 • (MSD) R3365145-8 12/04/18 12:50

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 20.6 | 5290 | 5280 | 105 | 105 | 1 | 70.0-130 | | | 0.226 | 20 |
| Copper | 50.0 | 2.25 | 52.5 | 53.5 | 100 | 102 | 1 | 70.0-130 | | | 1.91 | 20 |
| Iron | 5000 | U | 4950 | 5040 | 99.0 | 101 | 1 | 70.0-130 | | | 1.71 | 20 |
| Lead | 50.0 | 1.00 | 49.1 | 50.8 | 96.3 | 99.5 | 1 | 70.0-130 | | | 3.26 | 20 |
| Zinc | 50.0 | 96.8 | 146 | 150 | 97.6 | 106 | 1 | 70.0-130 | | | 2.73 | 20 |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| B | The same analyte is found in the associated blank. |
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |
| T8 | Sample(s) received past/too close to holding time expiration. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

| | |
|---|---|
| Alabama | 40660 |
| Alaska | 17-026 |
| Arizona | AZ0612 |
| Arkansas | 88-0469 |
| California | 2932 |
| Colorado | TN00003 |
| Connecticut | PH-0197 |
| Florida | E87487 |
| Georgia | NELAP |
| Georgia [1] | 923 |
| Idaho | TN00003 |
| Illinois | 200008 |
| Indiana | C-TN-01 |
| Iowa | 364 |
| Kansas | E-10277 |
| Kentucky [1,6] | 90010 |
| Kentucky [2] | 16 |
| Louisiana | AI30792 |
| Louisiana [1] | LA180010 |
| Maine | TN0002 |
| Maryland | 324 |
| Massachusetts | M-TN003 |
| Michigan | 9958 |
| Minnesota | 047-999-395 |
| Mississippi | TN00003 |
| Missouri | 340 |
| Montana | CERT0086 |
| Nebraska | NE-OS-15-05 |
| Nevada | TN-03-2002-34 |
| New Hampshire | 2975 |
| New Jersey–NELAP | TN002 |
| New Mexico [1] | n/a |
| New York | 11742 |
| North Carolina | Env375 |
| North Carolina [1] | DW21704 |
| North Carolina [3] | 41 |
| North Dakota | R-140 |
| Ohio–VAP | CL0069 |
| Oklahoma | 9915 |
| Oregon | TN200002 |
| Pennsylvania | 68-02979 |
| Rhode Island | LAO00356 |
| South Carolina | 84004 |
| South Dakota | n/a |
| Tennessee [1,4] | 2006 |
| Texas | T 104704245-17-14 |
| Texas [5] | LAB0152 |
| Utah | TN00003 |
| Vermont | VT2006 |
| Virginia | 460132 |
| Washington | C847 |
| West Virginia | 233 |
| Wisconsin | 9980939910 |
| Wyoming | A2LA |

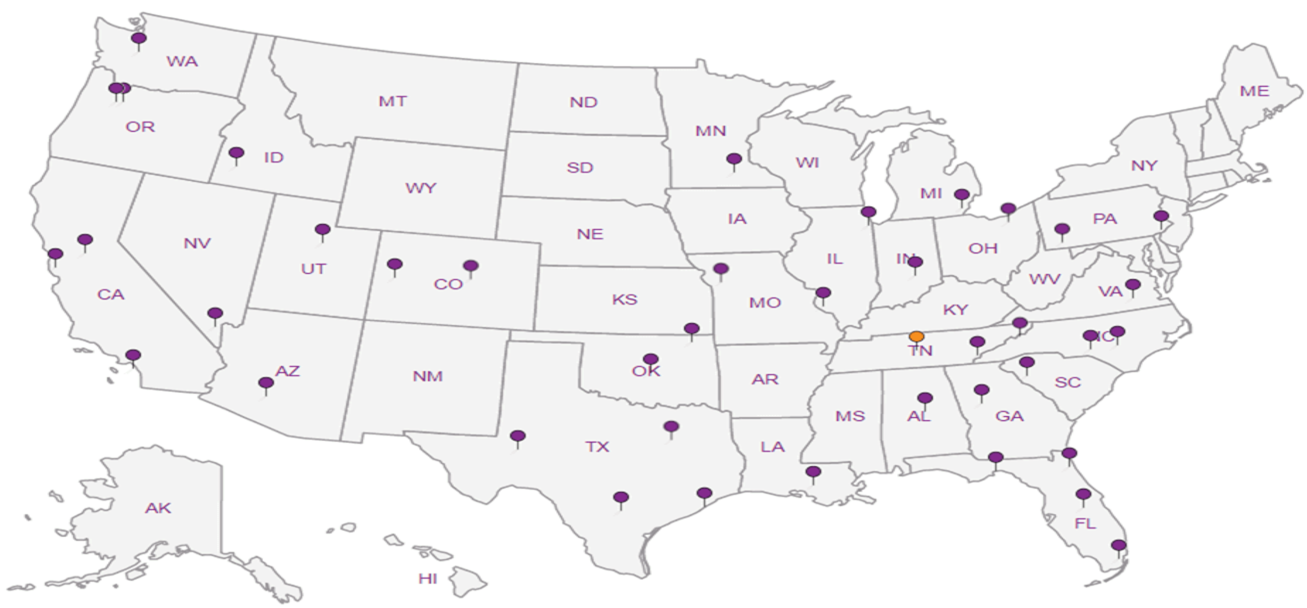
## Third Party Federal Accreditations

| | |
|---|---|
| A2LA – ISO 17025 | 1461.01 |
| A2LA – ISO 17025 [5] | 1461.02 |
| Canada | 1461.01 |
| EPA–Crypto | TN00003 |
| AIHA-LAP,LLC EMLAP | 100789 |
| DOD | 1461.01 |
| USDA | P330-15-00234 |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



# CHAIN OF CUSTODY RECORD

G033

**LABORATORY:**
ESC Laboratory
12065 Lebanon Road, Mt. Juliet, TN 37122
(615) 773-9772
Brian Ford

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaroud Time X Standard ☐ Other
GeoTracker EDF required? ☐ Yes X No
LOCUS EDD required? ☐ Yes X No
Report Results to: ☐ RL X MDL
Report soil results to: ☐ wet weight (total) ☐ dry weight

Specify analytic/prep method and detection limit in report. Notify us of any anomalous peaks in GC or other scans. Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:** BS
**Sample date(s):** 11/27/18

**PROJECT INFORMATION**

**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

COC Number:
Page____ of ____
SDG number: 1648432

ANALYSIS REQUESTED

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | pH (SM 4500HB) | Total Suspended Solids (SM 2540D) | Oil & Grease (EPA 1664A SGT-HEM) | Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS) | Total Metals- Al, Cu, Fe, Pb, Zn (EPA 200.8 ICP-MS) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TS1-E-181127 | 11/27/18 | 1608 | W | 5 | X | X | X | X | | 01 |
| | TS2-E-181127 | ↓ | 1639 | W | ↓ | X | X | X | | X | 02 |
| | TS3-E-181127 | ↓ | 1702 | W | ↓ | X | X | X | X | | 03 |
| | TS4-E-181127 | ↓ | 1715 | W | ↓ | X | X | X | X | | 04 |
| | TSX-E-181127 | ↓ | 1608 | W | 7 | X | X | X | | | Perform MS/MSD using additional volume provided -05 |
| | | | | | Field Filtered (X): | | | | | | |
| | Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | 1 | 1 | 1, 3 | 1, 4 | 1, 4 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks | CDIM | 11/27/18 / 1840 | | | |
| | | | | | |
| | | | K Cameron | | 11/30/18 0900 |

x = Samples released to a secured, locked area.
● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 808 256 9230 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 11/27/18 / 1840 |

4.9 +0.3 5.2

rec. 27 cont

# Pace Analytical National Center for Testing & Innovation
## Cooler Receipt Form

| | |
|---|---|
| Client: CDIENGSFCA | SDG# 1048432 |
| Cooler Received/Opened On: 11/30/18 | Temperature: 5.2 |
| Received By: Keteishia Cameron | |
| Signature: KCameron | |

| Receipt Check List | NP | Yes | No |
|---|---|---|---|
| COC Seal Present / Intact? | ✓ | | |
| COC Signed / Accurate? | | ✓ | |
| Bottles arrive intact? | | ✓ | |
| Correct bottles used? | | ✓ | |
| Sufficient volume sent? | | ✓ | |
| If Applicable | | | |
| VOA Zero headspace? | | ✓ | |
| Preservation Correct / Checked? | | | |

Kelsey Stephenson

Pace Analytical®
National Center for Testing & Innovation

L1048432

| Login #:L1048417 ~~ 12/4 | Client: CDIENGSFCA | Date: 11/30 | Evaluated by: Kelsey S |
|---|---|---|---|

**Non-Conformance (check applicable items)**

| | Sample Integrity | | Chain of Custody Clarification | | |
|---|---|---|---|---|---|
| | Parameter(s) past holding time | x | Login Clarification Needed | | **If Broken Container:** |
| | Temperature not in range | | Chain of custody is incomplete | | Insufficient packing material around container |
| | Improper container type | | Please specify Metals requested. | | Insufficient packing material inside cooler |
| | pH not in range. | | Please specify TCLP requested. | | Improper handling by carrier (FedEx / UPS / Courie |
| | Insufficient sample volume. | | Received additional samples not listed on coc. | | Sample was frozen |
| | Sample is biphasic. | | Sample ids on containers do not match ids on coc | | Container lid not intact |
| | Vials received with headspace. | | Trip Blank not received. | | **If no Chain of Custody:** |
| | Broken container | | Client did not "X" analysis. | | Received by: |
| | Broken container: | | Chain of Custody is missing | | Date/Time: |
| | Sufficient sample remains | | | | Temp./Cont. Rec./pH: |
| | | | | | Carrier: |
| | | | | | Tracking# |

**Login Comments: Client sent metals containers for ID TSX-E-181127 but did not mark any metal analysis. There is also a comment to Preform MS/MSD using additional volume sample for that ID.**

| Client informed by: | | Call | | Email x | | Voice Mail | | Date:12/04/18 | Time:0900 |
|---|---|---|---|---|---|---|---|---|---|
| TSR Initials:bjf | Client Contact: PMs | | | | | | | | |

**Login Instructions:**

Run lab duplicate analysis for TSX-E-181127, place metals on hold.

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

December 06, 2018

## CDIM Engineering - San Francisco, CA

| | |
|---|---|
| Sample Delivery Group: | L1048417 |
| Samples Received: | 11/30/2018 |
| Project Number: | 101-003, TASK 1 |
| Description: | LRTC 2018-2019 Industrial Stormwater |
| Site: | 402 WRIGHT AVE, RICHMOND, CA |
| Report To: | Mary Cunningham<br>45 Polk Street<br>3rd Floor<br>San Francisco, CA 94102 |

Entire Report Reviewed By: Brian Ford

Brian Ford
Project Manager



# TABLE OF CONTENTS

## TS1-I-181127 L1048417-01 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 11/27/18 15:48 | 11/30/18 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1204187 | 1 | 12/03/18 14:09 | 12/03/18 15:03 | AJS |
| Wet Chemistry by Method 1664A | WG1206239 | 1 | 12/05/18 16:08 | 12/05/18 20:02 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1204036 | 1 | 12/01/18 13:46 | 12/01/18 13:46 | KBW |
| Metals (ICPMS) by Method 200.8 | WG1204013 | 1 | 12/02/18 23:12 | 12/04/18 13:39 | LAT |

## TS2-I-181127 L1048417-02 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 11/27/18 16:36 | 11/30/18 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1204187 | 1 | 12/03/18 14:09 | 12/03/18 15:03 | AJS |
| Wet Chemistry by Method 1664A | WG1206239 | 1 | 12/05/18 16:08 | 12/05/18 20:02 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1204036 | 1 | 12/01/18 13:46 | 12/01/18 13:46 | KBW |
| Metals (ICPMS) by Method 200.8 | WG1204013 | 1 | 12/02/18 23:12 | 12/04/18 13:43 | LAT |

## TS3-I-181127 L1048417-03 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 11/27/18 16:56 | 11/30/18 09:00 |

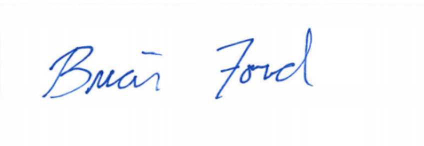
| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1204187 | 1 | 12/03/18 14:09 | 12/03/18 15:03 | AJS |
| Wet Chemistry by Method 1664A | WG1206239 | 1 | 12/05/18 16:08 | 12/05/18 20:02 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1204036 | 1 | 12/01/18 13:46 | 12/01/18 13:46 | KBW |
| Metals (ICPMS) by Method 200.8 | WG1204013 | 1 | 12/02/18 23:12 | 12/04/18 13:47 | LAT |

## TS4-I-181127 L1048417-04 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 11/27/18 17:23 | 11/30/18 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1204187 | 1 | 12/03/18 14:09 | 12/03/18 15:03 | AJS |
| Wet Chemistry by Method 1664A | WG1206239 | 1 | 12/05/18 16:08 | 12/05/18 20:02 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1204036 | 1 | 12/01/18 13:46 | 12/01/18 13:46 | KBW |
| Metals (ICPMS) by Method 200.8 | WG1204013 | 1 | 12/02/18 23:12 | 12/04/18 12:26 | RDS |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Brian Ford
Project Manager

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 1050000 | | 17500 | 125000 | 1 | 12/03/2018 15:03 | WG1204187 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 1460 | J | 884 | 6100 | 1 | 12/05/2018 20:02 | WG1206239 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.47 | T8 | 1 | 12/01/2018 13:46 | WG1204036 |

**Sample Narrative:**

L1048417-01 WG1204036: 7.47 at 18.6C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 7400 | | 20.0 | 100 | 1 | 12/04/2018 13:39 | WG1204013 |
| Iron | 6940 | | 15.0 | 100 | 1 | 12/04/2018 13:39 | WG1204013 |
| Lead | 110 | | 0.260 | 1.00 | 1 | 12/04/2018 13:39 | WG1204013 |
| Zinc | 351 | | 1.91 | 10.0 | 1 | 12/04/2018 13:39 | WG1204013 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 7200 | | 427 | 3050 | 1 | 12/03/2018 15:03 | WG1204187 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 797 | 5490 | 1 | 12/05/2018 20:02 | WG1206239 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.66 | T8 | 1 | 12/01/2018 13:46 | WG1204036 |

**Sample Narrative:**

L1048417-02 WG1204036: 7.66 at 18.2C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 54.0 | J | 20.0 | 100 | 1 | 12/04/2018 13:43 | WG1204013 |
| Copper | 28.7 | | 0.270 | 1.00 | 1 | 12/04/2018 13:43 | WG1204013 |
| Iron | 703 | | 15.0 | 100 | 1 | 12/04/2018 13:43 | WG1204013 |
| Lead | 1.66 | B | 0.260 | 1.00 | 1 | 12/04/2018 13:43 | WG1204013 |
| Zinc | 38.9 | | 1.91 | 10.0 | 1 | 12/04/2018 13:43 | WG1204013 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 24800 | | 494 | 3530 | 1 | 12/03/2018 15:03 | WG1204187 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 780 | 5380 | 1 | 12/05/2018 20:02 | WG1206239 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.47 | T8 | 1 | 12/01/2018 13:46 | WG1204036 |

**Sample Narrative:**

L1048417-03 WG1204036: 7.47 at 17.9C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 1150 | | 20.0 | 100 | 1 | 12/04/2018 13:47 | WG1204013 |
| Iron | 2470 | | 15.0 | 100 | 1 | 12/04/2018 13:47 | WG1204013 |
| Lead | 85.2 | | 0.260 | 1.00 | 1 | 12/04/2018 13:47 | WG1204013 |
| Zinc | 150 | | 1.91 | 10.0 | 1 | 12/04/2018 13:47 | WG1204013 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 1520 | J | 354 | 2530 | 1 | 12/03/2018 15:03 | WG1204187 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 763 | 5260 | 1 | 12/05/2018 20:02 | WG1206239 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.49 | T8 | 1 | 12/01/2018 13:46 | WG1204036 |

**Sample Narrative:**

L1048417-04 WG1204036: 7.49 at 17.7C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 95.7 | J | 20.0 | 100 | 1 | 12/04/2018 12:26 | WG1204013 |
| Iron | 230 | | 15.0 | 100 | 1 | 12/04/2018 12:26 | WG1204013 |
| Lead | 5.65 | | 0.260 | 1.00 | 1 | 12/04/2018 12:26 | WG1204013 |
| Zinc | 73.9 | | 1.91 | 10.0 | 1 | 12/04/2018 12:26 | WG1204013 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3365042-1 12/03/18 15:03

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 |

## L1048432-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1048432-03 12/03/18 15:03 • (DUP) R3365042-3 12/03/18 15:03

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 3000 | 2400 | 1 | 22.2 | J P1 | 5 |

**Sample Narrative:**

OS: Sample split with duplicate.

## L1048432-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1048432-05 12/03/18 15:03 • (DUP) R3365042-4 12/03/18 15:03

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 1000 | 0.000 | 1 | 200 | P1 | 5 |

**Sample Narrative:**

OS: Sample split with duplicate.

## Laboratory Control Sample (LCS)

(LCS) R3365042-2 12/03/18 15:03

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Suspended Solids | 773000 | 776000 | 100 | 85.0-115 | |

## Method Blank (MB)

(MB) R3365632-1 12/05/18 20:02

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| TPH - Oil & Grease | U | | 725 | 5000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365632-2 12/05/18 20:02 • (LCSD) R3365632-3 12/05/18 20:02

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 20000 | 19000 | 19800 | 95.0 | 99.0 | 64.0-132 | | | 4.12 | 18 |

## L1048183-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1048183-01 12/01/18 13:46 • (DUP) R3364437-3 12/01/18 13:46

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 9.77 | 9.73 | 1 | 0.410 | | 1 |

Sample Narrative:

OS: 9.77 at 19.6C

DUP: 9.73 at 18.8C

## L1048432-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1048432-05 12/01/18 13:46 • (DUP) R3364437-4 12/01/18 13:46

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 7.75 | 7.81 | 1 | 0.771 | | 1 |

Sample Narrative:

OS: 7.75 at 17.4C

DUP: 7.81 at 17.2C

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3364437-1 12/01/18 13:46 • (LCSD) R3364437-2 12/01/18 13:46

| Analyte | Spike Amount su | LCS Result su | LCSD Result su | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| pH | 10.0 | 10.0 | 10.1 | 100 | 101 | 99.0-101 | | | 0.398 | 1 |

Sample Narrative:

LCS: 10.04 at 19.7C

LCSD: 10.08 at 19.8C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3365145-1 12/04/18 12:14

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 |
| Copper | U | | 0.270 | 1.00 |
| Iron | U | | 15.0 | 100 |
| Lead | 0.351 | J | 0.260 | 1.00 |
| Zinc | U | | 1.91 | 10.0 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365145-2 12/04/18 12:18 • (LCSD) R3365145-3 12/04/18 12:22

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 4900 | 5080 | 98.0 | 102 | 85.0-115 | | | 3.51 | 20 |
| Copper | 50.0 | 48.8 | 49.5 | 97.6 | 99.1 | 85.0-115 | | | 1.47 | 20 |
| Iron | 5000 | 4840 | 4870 | 96.7 | 97.4 | 85.0-115 | | | 0.738 | 20 |
| Lead | 50.0 | 48.1 | 48.0 | 96.3 | 96.0 | 85.0-115 | | | 0.327 | 20 |
| Zinc | 50.0 | 49.2 | 49.5 | 98.3 | 99.1 | 85.0-115 | | | 0.764 | 20 |

## L1048417-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1048417-04 12/04/18 12:26 • (MS) R3365145-5 12/04/18 12:34 • (MSD) R3365145-6 12/04/18 12:38

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 95.7 | 5160 | 5280 | 101 | 104 | 1 | 70.0-130 | | | 2.25 | 20 |
| Copper | 50.0 | 81.2 | 126 | 127 | 90.2 | 91.0 | 1 | 70.0-130 | | | 0.302 | 20 |
| Iron | 5000 | 230 | 4860 | 4930 | 92.5 | 94.0 | 1 | 70.0-130 | | | 1.56 | 20 |
| Lead | 50.0 | 5.65 | 54.3 | 53.5 | 97.3 | 95.7 | 1 | 70.0-130 | | | 1.52 | 20 |
| Zinc | 50.0 | 73.9 | 124 | 123 | 99.6 | 97.4 | 1 | 70.0-130 | | | 0.899 | 20 |

## L1048432-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1048432-01 12/04/18 12:42 • (MS) R3365145-7 12/04/18 12:46 • (MSD) R3365145-8 12/04/18 12:50

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 20.6 | 5290 | 5280 | 105 | 105 | 1 | 70.0-130 | | | 0.226 | 20 |
| Copper | 50.0 | 2.25 | 52.5 | 53.5 | 100 | 102 | 1 | 70.0-130 | | | 1.91 | 20 |
| Iron | 5000 | U | 4950 | 5040 | 99.0 | 101 | 1 | 70.0-130 | | | 1.71 | 20 |
| Lead | 50.0 | 1.00 | 49.1 | 50.8 | 96.3 | 99.5 | 1 | 70.0-130 | | | 3.26 | 20 |
| Zinc | 50.0 | 96.8 | 146 | 150 | 97.6 | 106 | 1 | 70.0-130 | | | 2.73 | 20 |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| B | The same analyte is found in the associated blank. |
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |
| T8 | Sample(s) received past/too close to holding time expiration. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO00356 |
| Kentucky [1 6] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

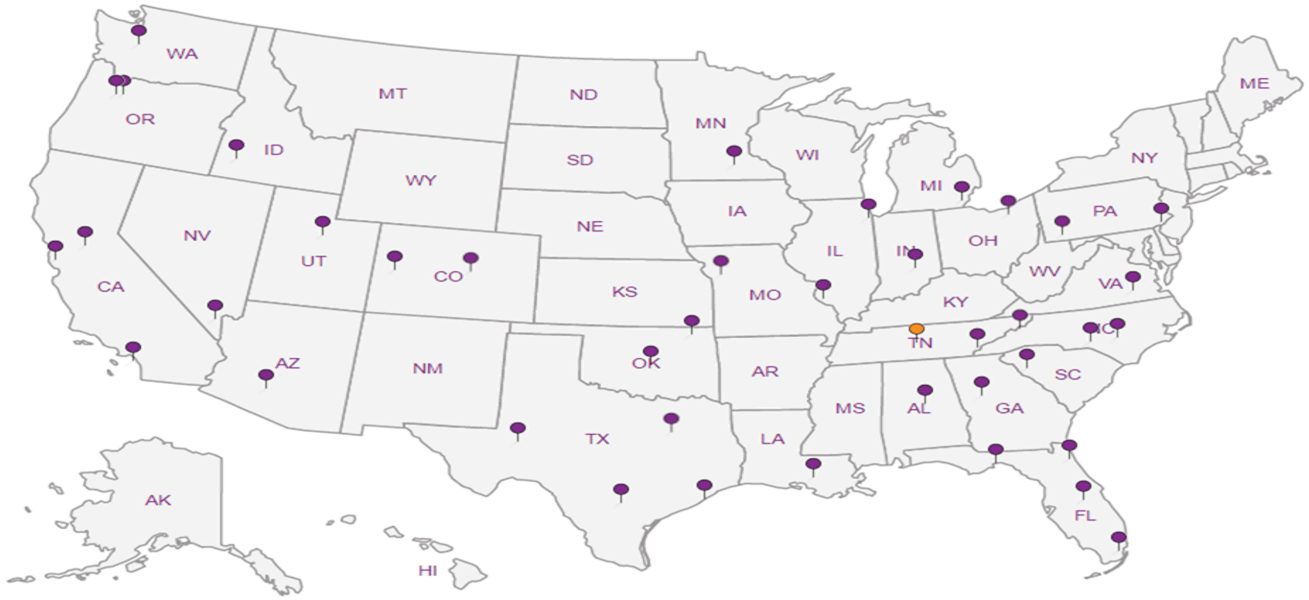
## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



G032

CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

**LABORATORY:**
ESC Laboratory
12065 Lebanon Road, Mt. Juliet, TN 37122
(615) 773-9772
Brian Ford

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaroud Time X Standard ☐ Other ______
GeoTracker EDF required? ☐ Yes X No
LOCUS EDD required? ☐ Yes X No
Report Results to: ☐ RL X MDL
Report soil results to: ☐ wet weight (total) ☐ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:** BS
**Sample date(s):** 11/27/18

**COC Number:**

Page 1 of 1

**SDG number:** 1048417

**PROJECT INFORMATION**
**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

**ANALYSIS REQUESTED**

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | pH (SM 4500HB) | Total Suspended Solids (SM 2540D) | Oil & Grease (EPA 1664A SGT-HEM) | Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS) | Total Metals- Al, Cu, Fe, Pb, Zn (EPA 200.8 ICP-MS) | | | | | | | | | | | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TS1-I-181127 | 11/27/18 | 1548 | W | 5 | X | X | X | X | | | | | | | | | | | | -01 |
| | TS2-I-181127 | ~~1636~~ | 1636 | W | | X | X | X | | X | | | | | | | | | | | 02 |
| | TS3-I-181127 | | 1656 | W | | X | X | X | X | | | | | | | | | | | | 03 |
| | TS4-I-181127 | | 1723 | W | | X | X | X | X | | | | | | | | | | | | 04 |
| | **Field Filtered (X):** | | | | | | | | | | | | | | | | | | | | |
| | Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other ______ | | | | | 1 | 1 | 1, 3 | 1, 4 | 1, 4 | | | | | | | | | | | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks | CDIM | 11/27/18/1840 | | | |
| | | | | | |
| | | | [signature] | | 11/30/18 0900 |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 808 256 9270 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 11/27/18 1840 |

4.9 +0.3 5.2 °C

rec. 20 conts

# Pace Analytical National Center for Testing & Innovation
## Cooler Receipt Form

| | | | |
|---|---|---|---|
| Client: COELENGSFCA | SDG# | 1048417 | |
| Cooler Received/Opened On: 11/30/18 | Temperature: | 5.2 | |
| Received By: Keteishia Cameron | | | |
| Signature: KCameron | | | |

| Receipt Check List | NP | Yes | No |
|---|---|---|---|
| COC Seal Present / Intact? | ✓ | | |
| COC Signed / Accurate? | | ✓ | |
| Bottles arrive intact? | | ✓ | |
| Correct bottles used? | | ✓ | |
| Sufficient volume sent? | | ✓ | |
| If Applicable | | | |
| VOA Zero headspace? | | | |
| Preservation Correct / Checked? | | ✓ | |

December 14, 2018

**Vista Work Order No. 1803776**

Mr. Scott Bourne
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, CA 94102

Dear Mr. Bourne,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on November 29, 2018 under your Project Name '101-003-LRTC, Task 1'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director



Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

**Vista Work Order No. 1803776**
**Case Narrative**

**Sample Condition on Receipt:**

One water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

**Analytical Notes:**

**<u>EPA Method 1699</u>**

The sample was extracted and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

<u>Holding Times</u>

The sample was extracted and analyzed within the method hold times.

<u>Quality Control</u>

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

Labeled standard recoveries for all QC and field samples were within method acceptance criteria.

TABLE OF CONTENTS

# Sample Inventory Report

| Vista Sample ID | Client Sample ID | Sampled | Received | Components/Containers |
|---|---|---|---|---|
| 1803776-01 | TS2-E-181127 | 27-Nov-18 16:36 | 29-Nov-18 08:10 | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |

# ANALYTICAL RESULTS

| **Sample ID:** | **Method Blank** | **EPA Method 1699** |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B8L0002 | Lab Sample: | B8L0002-BLK1 |
| Sample Size: | 1.00 L | Date Extracted: | 03-Dec-2018 6:10 | Date Analyzed: | 06-Dec-18 02:43 Column: ZB-50 |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 7.47 | | | J |
| alpha-BHC | ND | 2.02 | | |
| Lindane (gamma-BHC) | ND | 3.00 | | |
| beta-BHC | ND | 2.78 | | |
| delta-BHC | ND | 2.33 | | |
| Heptachlor | ND | 1.20 | | |
| Aldrin | ND | 1.41 | | |
| Oxychlordane | ND | 5.91 | | |
| cis-Heptachlor Epoxide | ND | 4.61 | | |
| trans-Heptachlor Epoxide | ND | 14.0 | | |
| trans-Chlordane (gamma) | ND | 5.08 | | |
| trans-Nonachlor | ND | 5.55 | | |
| cis-Chlordane (alpha) | ND | 5.39 | | |
| Endosulfan I (alpha) | ND | 7.38 | | |
| 2,4'-DDE | ND | 1.43 | | |
| 4,4'-DDE | ND | 1.94 | | |
| Dieldrin | ND | 1.44 | | |
| Endrin | ND | 3.99 | | |
| cis-Nonachlor | ND | 3.77 | | |
| Endosulfan II (beta) | ND | 9.49 | | |
| 2,4'-DDD | ND | 2.45 | | |
| 2,4'-DDT | ND | 5.43 | | |
| 4,4'-DDD | ND | 3.12 | | |
| 4,4'-DDT | ND | 7.85 | | |
| Endosulfan Sulfate | ND | 6.92 | | |
| 4,4'-Methoxychlor | ND | 9.00 | | |
| Mirex | ND | 7.85 | | |
| Endrin Aldehyde | ND | 8.78 | | |
| Endrin Ketone | ND | 19.2 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 52.2 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 75.1 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 79.5 | 11 - 120 | |
| IS | 13C6-beta-BHC | 85.2 | 32 - 130 | |
| IS | 13C6-delta-BHC | 87.3 | 36 - 137 | |
| IS | 13C10-Heptachlor | 81.3 | 5 - 120 | |
| IS | 13C12-Aldrin | 75.3 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 86.9 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 85.2 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 73.1 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 74.8 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 70.4 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 78.2 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 71.5 | 47 - 160 | |
| IS | 13C12-Dieldrin | 66.4 | 40 - 151 | |
| IS | 13C12-Endrin | 72.4 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 58.6 | 36 - 139 | |
| IS | 13C9-Endosulfan II (beta) | 54.5 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 71.6 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 58.4 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 59.7 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 51.6 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 46.3 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 34.9 | 5 - 120 | |
| IS | 13C10-Mirex | 20.6 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 24.9 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 33.4 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Vista Analytical Laboratory

## Sample ID: OPR

**EPA Method 1699**

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B8L0002 | Lab Sample: | B8L0002-BS1 |
| Sample Size: | 1.00 L | Date Extracted: | 03-Dec-2018 6:10 | Date Analyzed: | 05-Dec-18 23:28 Column: ZB-50 |

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits |
|---|---|---|---|---|
| Hexachlorobenzene | 1070 | 1000 | 107 | 50 - 120 |
| alpha-BHC | 1030 | 1000 | 103 | 50 - 120 |
| Lindane (gamma-BHC) | 1040 | 1000 | 104 | 50 - 120 |
| beta-BHC | 999 | 1000 | 99.9 | 50 - 120 |
| delta-BHC | 991 | 1000 | 99.1 | 50 - 120 |
| Heptachlor | 930 | 1000 | 93.0 | 50 - 120 |
| Aldrin | 954 | 1000 | 95.4 | 50 - 120 |
| Oxychlordane | 985 | 1000 | 98.5 | 50 - 120 |
| cis-Heptachlor Epoxide | 940 | 1000 | 94.0 | 50 - 120 |
| trans-Heptachlor Epoxide | 900 | 1000 | 90.0 | 50 - 120 |
| trans-Chlordane (gamma) | 983 | 1000 | 98.3 | 50 - 120 |
| trans-Nonachlor | 993 | 1000 | 99.3 | 50 - 120 |
| cis-Chlordane (alpha) | 1060 | 1000 | 106 | 50 - 120 |
| Endosulfan I (alpha) | 994 | 1000 | 99.4 | 50 - 120 |
| 2,4'-DDE | 1010 | 1000 | 101 | 24 - 123 |
| 4,4'-DDE | 1020 | 1000 | 102 | 50 - 120 |
| Dieldrin | 940 | 1000 | 94.0 | 50 - 120 |
| Endrin | 933 | 1000 | 93.3 | 50 - 120 |
| cis-Nonachlor | 980 | 1000 | 98.0 | 50 - 120 |
| Endosulfan II (beta) | 973 | 1000 | 97.3 | 5 - 200 |
| 2,4'-DDD | 1040 | 1000 | 104 | 50 - 120 |
| 2,4'-DDT | 1160 | 1000 | 116 | 50 - 120 |
| 4,4'-DDD | 1060 | 1000 | 106 | 42 - 120 |
| 4,4'-DDT | 1060 | 1000 | 106 | 50 - 120 |
| Endosulfan Sulfate | 860 | 1000 | 86.0 | 50 - 120 |
| 4,4'-Methoxychlor | 1030 | 1000 | 103 | 50 - 120 |
| Mirex | 1050 | 1000 | 105 | 50 - 120 |
| Endrin Aldehyde | 1090 | 1000 | 109 | 50 - 134 |
| Endrin Ketone | 1030 | 1000 | 103 | 50 - 134 |

| | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 53.5 | 5 - 120 |
| IS | 13C6-alpha-BHC | 78.0 | 17 - 141 |
| IS | 13C6-Lindane (gamma-BHC) | 84.0 | 5 - 124 |
| IS | 13C6-beta-BHC | 90.4 | 17 - 141 |
| IS | 13C6-delta-BHC | 88.8 | 16 - 150 |
| IS | 13C10-Heptachlor | 89.8 | 5 - 128 |
| IS | 13C12-Aldrin | 85.0 | 5 - 126 |
| IS | 13C10-Oxychlordane | 93.5 | 5 - 144 |
| IS | 13C10-cis-Heptachlor Epoxide | 94.1 | 8 - 146 |
| IS | 13C10-trans-Chlordane (gamma) | 86.5 | 15 - 144 |
| IS | 13C10-trans-Nonachlor | 87.7 | 13 - 149 |
| IS | 13C9-Endosulfan I (alpha) | 87.2 | 5 - 144 |
| IS | 13C12-2,4'-DDE | 93.9 | 26 - 169 |
| IS | 13C12-4,4'-DDE | 87.6 | 26 - 169 |
| IS | 13C12-Dieldrin | 83.8 | 19 - 161 |
| IS | 13C12-Endrin | 97.0 | 20 - 157 |
| IS | 13C10-cis-Nonachlor | 78.1 | 17 - 154 |
| IS | 13C9-Endosulfan II (beta) | 70.2 | 5 - 120 |
| IS | 13C12-2,4'-DDD | 88.1 | 14 - 200 |
| IS | 13C12-2,4'-DDT | 80.8 | 14 - 200 |
| IS | 13C12-4,4'-DDD | 82.5 | 14 - 200 |
| IS | 13C12-4,4'-DDT | 86.6 | 13 - 200 |
| IS | 13C9-Endosulfan Sulfate | 75.1 | 5 - 144 |
| IS | 13C12-Methoxychlor | 85.8 | 8 - 200 |
| IS | 13C10-Mirex | 66.0 | 5 - 138 |
| IS | 13C12-Endrin Aldehyde | 30.6 | 5 - 144 |
| IS | 13C12-Endrin Ketone | 68.8 | 5 - 144 |

LCL-UCL - Lower control limit - upper control limit

| **Sample ID: TS2-E-181127** | | **EPA Method 1699** |
|---|---|---|
| **Client Data**<br>Name: CDIM Engineering<br>Project: 101-003-LRTC, Task 1<br>Date Collected: 27-Nov-2018 16:36 | **Sample Data**<br>Matrix: Water<br>Sample Size: 1.03 L | **Laboratory Data**<br>Lab Sample: 1803776-01<br>QC Batch: B8L0002<br>Date Analyzed: 06-Dec-18 03:32 Column: ZB-50<br>Date Received: 29-Nov-2018 8:10<br>Date Extracted: 03-Dec-2018 6:10 |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers | | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|
| Hexachlorobenzene | 12.6 | | | J, B | IS | 13C6-Hexachlorobenzene | 60.1 | 5 - 120 | |
| alpha-BHC | 43.0 | | | | IS | 13C6-alpha-BHC | 74.8 | 32 - 130 | |
| Lindane (gamma-BHC) | 30.3 | | | J | IS | 13C6-Lindane (gamma-BHC) | 81.8 | 11 - 120 | |
| beta-BHC | 40.3 | | | | IS | 13C6-beta-BHC | 89.3 | 32 - 130 | |
| delta-BHC | ND | 2.05 | | | IS | 13C6-delta-BHC | 89.2 | 36 - 137 | |
| Heptachlor | ND | 2.33 | | | IS | 13C10-Heptachlor | 84.6 | 5 - 120 | |
| Aldrin | ND | 3.30 | | | IS | 13C12-Aldrin | 71.2 | 5 - 120 | |
| Oxychlordane | ND | 13.1 | | | IS | 13C10-Oxychlordane | 89.0 | 23 - 135 | |
| cis-Heptachlor Epoxide | ND | | 52.0 | | IS | 13C10-cis-Heptachlor Epoxide | 91.0 | 27 - 137 | |
| trans-Heptachlor Epoxide | ND | 29.5 | | | IS | 13C10-trans-Chlordane (gamma) | 75.9 | 21 - 132 | |
| trans-Chlordane (gamma) | 34.1 | | | J | IS | 13C10-trans-Nonachlor | 76.8 | 14 - 136 | |
| trans-Nonachlor | ND | 11.9 | | | IS | 13C9-Endosulfan I (alpha) | 73.4 | 15 - 148 | |
| cis-Chlordane (alpha) | 65.1 | | | | IS | 13C12-2,4'-DDE | 80.4 | 47 - 160 | |
| Endosulfan I (alpha) | ND | 15.0 | | | IS | 13C12-4,4'-DDE | 73.2 | 47 - 160 | |
| 2,4'-DDE | ND | 1.26 | | | IS | 13C12-Dieldrin | 69.5 | 40 - 151 | |
| 4,4'-DDE | 52.8 | | | | IS | 13C12-Endrin | 95.7 | 35 - 155 | |
| Dieldrin | 787 | | | | IS | 13C10-cis-Nonachlor | 64.4 | 36 - 139 | |
| Endrin | 271 | | | | IS | 13C9-Endosulfan II (beta) | 60.3 | 5 - 122 | |
| cis-Nonachlor | ND | 7.19 | | | IS | 13C12-2,4'-DDD | 76.1 | 5 - 199 | |
| Endosulfan II (beta) | ND | 24.0 | | | IS | 13C12-2,4'-DDT | 67.7 | 5 - 199 | |
| 2,4'-DDD | 54.7 | | | | IS | 13C12-4,4'-DDD | 66.7 | 5 - 120 | |
| 2,4'-DDT | 13.5 | | | J | IS | 13C12-4,4'-DDT | 63.1 | 5 - 120 | |
| 4,4'-DDD | 71.7 | | | | IS | 13C9-Endosulfan Sulfate | 54.2 | 15 - 148 | |
| 4,4'-DDT | 70.1 | | | | IS | 13C12-Methoxychlor | 49.2 | 5 - 120 | |
| Endosulfan Sulfate | ND | 10.7 | | | IS | 13C10-Mirex | 31.4 | 5 - 120 | |
| 4,4'-Methoxychlor | ND | 6.75 | | | IS | 13C12-Endrin Aldehyde | 25.4 | 15 - 148 | |
| Mirex | ND | 5.25 | | | IS | 13C12-Endrin Ketone | 42.7 | 15 - 148 | |
| Endrin Aldehyde | 50.5 | | | J | | | | | |
| Endrin Ketone | 495 | | | | | | | | |

DL - Sample specifc estimated detection limit

LCL-UCL - Lower control limit - upper control limit

EMPC - Estimated maximum possible concentration

## DATA QUALIFIERS & ABBREVIATIONS

| | |
|---|---|
| **B** | **This compound was also detected in the method blank** |
| **Conc.** | **Concentration** |
| **D** | **Dilution** |
| **DL** | **Detection limit** |
| **E** | **The associated compound concentration exceeded the calibration range of the instrument** |
| **H** | **Recovery and/or RPD was outside laboratory acceptance limits** |
| **I** | **Chemical Interference** |
| **J** | **The amount detected is below the Reporting Limit/LOQ** |
| **LOD** | **Limits of Detection** |
| **LOQ** | **Limits of Quantitation** |
| **M** | **Estimated Maximum Possible Concentration (CA Region 2 projects only)** |
| **NA** | **Not applicable** |
| **ND** | **Not Detected** |
| **Q** | **Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)** |
| **TEQ** | **Toxic Equivalency** |
| **U** | **Not Detected (specific projects only)** |
| ***** | **See Cover Letter** |

**Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.**

## Vista Analytical Laboratory Certifications

| Accrediting Authority | Certificate Number |
|---|---|
| Alaska Department of Environmental Conservation | 17-013 |
| Arkansas Department of Environmental Quality | 18-008-0 |
| California Department of Health – ELAP | 2892 |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005 | 3091.01 |
| Florida Department of Health | E87777 |
| Hawaii Department of Health | N/A |
| Louisiana Department of Environmental Quality | 01977 |
| Maine Department of Health | 2018017 |
| Michigan Department of Environmental Quality | 9932 |
| Minnesota Department of Health | 1322288 |
| New Hampshire Environmental Accreditation Program | 207718 |
| New Jersey Department of Environmental Protection | CA003 |
| New York Department of Health | 11411 |
| Oregon Laboratory Accreditation Program | 4042-009 |
| Pennsylvania Department of Environmental Protection | 015 |
| Texas Commission on Environmental Quality | T104704189-18-9 |
| Virginia Department of General Services | 9618 |
| Washington Department of Ecology | C584-18 |
| Wisconsin Department of Natural Resources | 998036160 |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

| MATRIX: Air | |
|---|---|
| **Description of Test** | **Method** |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23 |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water | |
|---|---|
| **Description of Test** | **Method** |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS | EPA 522 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Dioxin by GC/HRMS | EPA 613 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids | |
|---|---|
| **Description of Test** | **Method** |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613 |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

1803776 1.4°c

**LABORATORY:**
Vista Analytical
1104 Windfield Way, El Dorado Hills CA 95762
(916) 673-1520
Karen Volpendesta

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaroud Time X Standard ☐ Other
GeoTracker EDF required? ☐ Yes X No
LOCUS EDD required? ☐ Yes X No
Report Results to: ☐ RL X MDL
Report soil results to: ☐ wet weight (total) ☐ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**COC Number:**

Page 1 of 1

**SDG number:**

**PROJECT INFORMATION**

**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

ANALYSIS REQUESTED

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | Pesticides (EPA 1699) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|
| | TS2-E-181127 | 11/27/18 | 1630 | W | 3 | X | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| **Field Filtered (X):** | | | | | | | |
| Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other ____ | | | | | | 1 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks ☐ | CDIM | 11/27/18 / 1826 | Kim Eric ○ | VAL | 11/29/18 0810 |
| ☐ | | | ○ | | |
| ☐ | | | ○ | | |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 808256 9230 |
| SAMPLERS SIGNATURE | | DATE / TIME | 11/23/18 / 1826 |

Vista
Analytical Laboratory

# Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1803776 TAT Std

| | | | |
|---|---|---|---|
| **Samples Arrival:** | **Date/Time** 11/29/18 0810 | **Initials:** KE | **Location:** WR-2 **Shelf/Rack:** NA |
| **Logged In:** | **Date/Time** 11/29/18 0913 | **Initials:** KE | **Location:** WR-2 **Shelf/Rack:** A2/B2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Delivered By:** | FedEx | UPS | On Trac | GSO | DHL | Hand Delivered | Other |
| **Preservation:** | Ice | ~~Blue Ice~~ | | Dry Ice | | | None |

| | | | |
|---|---|---|---|
| **Temp °C:** 1.5 | **(uncorrected)** | + MELTED ICE ~~**Probe used:**~~ Y / N | **Thermometer ID:** IR-4 |
| **Temp °C:** 1.4 | **(corrected)** | | |

| | | YES | NO | NA |
|---|---|---|---|---|
| Adequate Sample Volume Received? | | ✓ | | |
| Holding Time Acceptable? | | ✓ | | |
| Shipping Container(s) Intact? | | ✓ | | |
| Shipping Custody Seals Intact? | | ✓ | | |
| Shipping Documentation Present? | | ✓ | | |
| Airbill | Trk # 7840 4099 5055 | ✓ | | |
| Sample Container Intact? | | ✓ | | |
| Sample Custody Seals Intact? | | | | ✓ |
| Chain of Custody / Sample Documentation Present? | | ✓ | | |
| COC Anomaly/Sample Acceptance Form completed? | | | | ✓ |

| | | | | | |
|---|---|---|---|---|---|
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? | | | | | ✓ |
| Preservation Documented: | $Na_2S_2O_3$ Trizma None Other | | Yes | No | NA |
| Shipping Container | Vista | Client | Retain | Return | Dispose |

*Comments:*

December 14, 2018

**Vista Work Order No. 1803777**

Mr. Scott Bourne
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, CA 94102

Dear Mr. Bourne,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on November 29, 2018 under your Project Name '101-003-LRTC, Task 1'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

**Vista Work Order No. 1803777**
**Case Narrative**

**Sample Condition on Receipt:**

One water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The client was notified of the receipt of a broken container. The client authorized the laboratory to proceed with the analysis on November 29, 2018.

**Analytical Notes:**

**EPA Method 1699**

The sample was extracted and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

Labeled standard recoveries for all QC and field samples were within method acceptance criteria.

TABLE OF CONTENTS

# Sample Inventory Report

| Vista Sample ID | Client Sample ID | Sampled | Received | Components/Containers |
|---|---|---|---|---|
| 1803777-01 | TS2-I-181127 | 27-Nov-18 16:36 | 29-Nov-18 08:10 | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |

Vista Project: 1803777 Client Project: 101-003-LRTC, Task 1

# ANALYTICAL RESULTS

| **Sample ID:** | **Method Blank** | | **EPA Method 1699** |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B8L0002 | Lab Sample: | B8L0002-BLK1 |
| Sample Size: | 1.00 L | Date Extracted: | 03-Dec-2018 6:10 | Date Analyzed: | 06-Dec-18 02:43 Column: ZB-50 |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 7.47 | | | J |
| alpha-BHC | ND | 2.02 | | |
| Lindane (gamma-BHC) | ND | 3.00 | | |
| beta-BHC | ND | 2.78 | | |
| delta-BHC | ND | 2.33 | | |
| Heptachlor | ND | 1.20 | | |
| Aldrin | ND | 1.41 | | |
| Oxychlordane | ND | 5.91 | | |
| cis-Heptachlor Epoxide | ND | 4.61 | | |
| trans-Heptachlor Epoxide | ND | 14.0 | | |
| trans-Chlordane (gamma) | ND | 5.08 | | |
| trans-Nonachlor | ND | 5.55 | | |
| cis-Chlordane (alpha) | ND | 5.39 | | |
| Endosulfan I (alpha) | ND | 7.38 | | |
| 2,4'-DDE | ND | 1.43 | | |
| 4,4'-DDE | ND | 1.94 | | |
| Dieldrin | ND | 1.44 | | |
| Endrin | ND | 3.99 | | |
| cis-Nonachlor | ND | 3.77 | | |
| Endosulfan II (beta) | ND | 9.49 | | |
| 2,4'-DDD | ND | 2.45 | | |
| 2,4'-DDT | ND | 5.43 | | |
| 4,4'-DDD | ND | 3.12 | | |
| 4,4'-DDT | ND | 7.85 | | |
| Endosulfan Sulfate | ND | 6.92 | | |
| 4,4'-Methoxychlor | ND | 9.00 | | |
| Mirex | ND | 7.85 | | |
| Endrin Aldehyde | ND | 8.78 | | |
| Endrin Ketone | ND | 19.2 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 52.2 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 75.1 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 79.5 | 11 - 120 | |
| IS | 13C6-beta-BHC | 85.2 | 32 - 130 | |
| IS | 13C6-delta-BHC | 87.3 | 36 - 137 | |
| IS | 13C10-Heptachlor | 81.3 | 5 - 120 | |
| IS | 13C12-Aldrin | 75.3 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 86.9 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 85.2 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 73.1 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 74.8 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 70.4 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 78.2 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 71.5 | 47 - 160 | |
| IS | 13C12-Dieldrin | 66.4 | 40 - 151 | |
| IS | 13C12-Endrin | 72.4 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 58.6 | 36 - 139 | |
| IS | 13C9-Endosulfan II (beta) | 54.5 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 71.6 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 58.4 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 59.7 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 51.6 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 46.3 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 34.9 | 5 - 120 | |
| IS | 13C10-Mirex | 20.6 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 24.9 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 33.4 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

**Sample ID: OPR** | **EPA Method 1699**

| | | | |
|---|---|---|---|
| Matrix: Aqueous | QC Batch: B8L0002 | Lab Sample: B8L0002-BS1 | |
| Sample Size: 1.00 L | Date Extracted: 03-Dec-2018 6:10 | Date Analyzed: 05-Dec-18 23:28 | Column: ZB-50 |

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits |
|---|---|---|---|---|
| Hexachlorobenzene | 1070 | 1000 | 107 | 50 - 120 |
| alpha-BHC | 1030 | 1000 | 103 | 50 - 120 |
| Lindane (gamma-BHC) | 1040 | 1000 | 104 | 50 - 120 |
| beta-BHC | 999 | 1000 | 99.9 | 50 - 120 |
| delta-BHC | 991 | 1000 | 99.1 | 50 - 120 |
| Heptachlor | 930 | 1000 | 93.0 | 50 - 120 |
| Aldrin | 954 | 1000 | 95.4 | 50 - 120 |
| Oxychlordane | 985 | 1000 | 98.5 | 50 - 120 |
| cis-Heptachlor Epoxide | 940 | 1000 | 94.0 | 50 - 120 |
| trans-Heptachlor Epoxide | 900 | 1000 | 90.0 | 50 - 120 |
| trans-Chlordane (gamma) | 983 | 1000 | 98.3 | 50 - 120 |
| trans-Nonachlor | 993 | 1000 | 99.3 | 50 - 120 |
| cis-Chlordane (alpha) | 1060 | 1000 | 106 | 50 - 120 |
| Endosulfan I (alpha) | 994 | 1000 | 99.4 | 50 - 120 |
| 2,4'-DDE | 1010 | 1000 | 101 | 24 - 123 |
| 4,4'-DDE | 1020 | 1000 | 102 | 50 - 120 |
| Dieldrin | 940 | 1000 | 94.0 | 50 - 120 |
| Endrin | 933 | 1000 | 93.3 | 50 - 120 |
| cis-Nonachlor | 980 | 1000 | 98.0 | 50 - 120 |
| Endosulfan II (beta) | 973 | 1000 | 97.3 | 5 - 200 |
| 2,4'-DDD | 1040 | 1000 | 104 | 50 - 120 |
| 2,4'-DDT | 1160 | 1000 | 116 | 50 - 120 |
| 4,4'-DDD | 1060 | 1000 | 106 | 42 - 120 |
| 4,4'-DDT | 1060 | 1000 | 106 | 50 - 120 |
| Endosulfan Sulfate | 860 | 1000 | 86.0 | 50 - 120 |
| 4,4'-Methoxychlor | 1030 | 1000 | 103 | 50 - 120 |
| Mirex | 1050 | 1000 | 105 | 50 - 120 |
| Endrin Aldehyde | 1090 | 1000 | 109 | 50 - 134 |
| Endrin Ketone | 1030 | 1000 | 103 | 50 - 134 |

| | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 53.5 | 5 - 120 |
| IS | 13C6-alpha-BHC | 78.0 | 17 - 141 |
| IS | 13C6-Lindane (gamma-BHC) | 84.0 | 5 - 124 |
| IS | 13C6-beta-BHC | 90.4 | 17 - 141 |
| IS | 13C6-delta-BHC | 88.8 | 16 - 150 |
| IS | 13C10-Heptachlor | 89.8 | 5 - 128 |
| IS | 13C12-Aldrin | 85.0 | 5 - 126 |
| IS | 13C10-Oxychlordane | 93.5 | 5 - 144 |
| IS | 13C10-cis-Heptachlor Epoxide | 94.1 | 8 - 146 |
| IS | 13C10-trans-Chlordane (gamma) | 86.5 | 15 - 144 |
| IS | 13C10-trans-Nonachlor | 87.7 | 13 - 149 |
| IS | 13C9-Endosulfan I (alpha) | 87.2 | 5 - 144 |
| IS | 13C12-2,4'-DDE | 93.9 | 26 - 169 |
| IS | 13C12-4,4'-DDE | 87.6 | 26 - 169 |
| IS | 13C12-Dieldrin | 83.8 | 19 - 161 |
| IS | 13C12-Endrin | 97.0 | 20 - 157 |
| IS | 13C10-cis-Nonachlor | 78.1 | 17 - 154 |
| IS | 13C9-Endosulfan II (beta) | 70.2 | 5 - 120 |
| IS | 13C12-2,4'-DDD | 88.1 | 14 - 200 |
| IS | 13C12-2,4'-DDT | 80.8 | 14 - 200 |
| IS | 13C12-4,4'-DDD | 82.5 | 14 - 200 |
| IS | 13C12-4,4'-DDT | 86.6 | 13 - 200 |
| IS | 13C9-Endosulfan Sulfate | 75.1 | 5 - 144 |
| IS | 13C12-Methoxychlor | 85.8 | 8 - 200 |
| IS | 13C10-Mirex | 66.0 | 5 - 138 |
| IS | 13C12-Endrin Aldehyde | 30.6 | 5 - 144 |
| IS | 13C12-Endrin Ketone | 68.8 | 5 - 144 |

LCL-UCL - Lower control limit - upper control limit

## Sample ID: TS2-I-181127 — EPA Method 1699

| Client Data | | Sample Data | | Laboratory Data | | | |
|---|---|---|---|---|---|---|---|
| Name: | CDIM Engineering | Matrix: | Water | Lab Sample: | 1803777-01 | Date Received: | 29-Nov-2018 8:10 |
| Project: | 101-003-LRTC, Task 1 | Sample Size: | 1.04 L | QC Batch: | B8L0002 | Date Extracted: | 03-Dec-2018 6:10 |
| Date Collected: | 27-Nov-2018 16:36 | | | Date Analyzed: | 06-Dec-18 04:21 Column: ZB-50 | | |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers | | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|
| Hexachlorobenzene | 48.4 | | | B | IS | 13C6-Hexachlorobenzene | 65.4 | 5 - 120 | |
| alpha-BHC | 20.5 | | | J | IS | 13C6-alpha-BHC | 80.4 | 32 - 130 | |
| Lindane (gamma-BHC) | 13.3 | | | J | IS | 13C6-Lindane (gamma-BHC) | 86.3 | 11 - 120 | |
| beta-BHC | 67.9 | | | | IS | 13C6-beta-BHC | 90.3 | 32 - 130 | |
| delta-BHC | 5.93 | | | J | IS | 13C6-delta-BHC | 88.9 | 36 - 137 | |
| Heptachlor | ND | 3.48 | | | IS | 13C10-Heptachlor | 86.8 | 5 - 120 | |
| Aldrin | 17.2 | | | J | IS | 13C12-Aldrin | 72.0 | 5 - 120 | |
| Oxychlordane | 30.4 | | | J | IS | 13C10-Oxychlordane | 89.0 | 23 - 135 | |
| cis-Heptachlor Epoxide | 285 | | | | IS | 13C10-cis-Heptachlor Epoxide | 90.7 | 27 - 137 | |
| trans-Heptachlor Epoxide | ND | 45.1 | | | IS | 13C10-trans-Chlordane (gamma) | 75.4 | 21 - 132 | |
| trans-Chlordane (gamma) | 631 | | | | IS | 13C10-trans-Nonachlor | 63.5 | 14 - 136 | |
| trans-Nonachlor | 426 | | | | IS | 13C9-Endosulfan I (alpha) | 61.1 | 15 - 148 | |
| cis-Chlordane (alpha) | 1800 | | | | IS | 13C12-2,4'-DDE | 70.7 | 47 - 160 | |
| Endosulfan I (alpha) | ND | 30.8 | | | IS | 13C12-4,4'-DDE | 60.7 | 47 - 160 | |
| 2,4'-DDE | 44.7 | | | | IS | 13C12-Dieldrin | 60.7 | 40 - 151 | |
| 4,4'-DDE | 985 | | | | IS | 13C12-Endrin | 78.4 | 35 - 155 | |
| Dieldrin | 3370 | | | | IS | 13C10-cis-Nonachlor | 47.0 | 36 - 139 | |
| Endrin | 482 | | | | IS | 13C9-Endosulfan II (beta) | 37.8 | 5 - 122 | |
| cis-Nonachlor | 79.0 | | | | IS | 13C12-2,4'-DDD | 59.1 | 5 - 199 | |
| Endosulfan II (beta) | ND | 112 | | | IS | 13C12-2,4'-DDT | 45.2 | 5 - 199 | |
| 2,4'-DDD | 1200 | | | | IS | 13C12-4,4'-DDD | 44.3 | 5 - 120 | |
| 2,4'-DDT | 356 | | | | IS | 13C12-4,4'-DDT | 33.0 | 5 - 120 | |
| 4,4'-DDD | 2260 | | | | IS | 13C9-Endosulfan Sulfate | 32.2 | 15 - 148 | |
| 4,4'-DDT | 1670 | | | | IS | 13C12-Methoxychlor | 21.4 | 5 - 120 | |
| Endosulfan Sulfate | ND | 25.8 | | | IS | 13C10-Mirex | 16.5 | 5 - 120 | |
| 4,4'-Methoxychlor | ND | 213 | | | IS | 13C12-Endrin Aldehyde | 20.1 | 15 - 148 | |
| Mirex | ND | 11.4 | | | IS | 13C12-Endrin Ketone | 20.1 | 15 - 148 | |
| Endrin Aldehyde | 69.0 | | | J | | | | | |
| Endrin Ketone | 718 | | | | | | | | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

# DATA QUALIFIERS & ABBREVIATIONS

| | |
|---|---|
| **B** | **This compound was also detected in the method blank** |
| **Conc.** | **Concentration** |
| **D** | **Dilution** |
| **DL** | **Detection limit** |
| **E** | **The associated compound concentration exceeded the calibration range of the instrument** |
| **H** | **Recovery and/or RPD was outside laboratory acceptance limits** |
| **I** | **Chemical Interference** |
| **J** | **The amount detected is below the Reporting Limit/LOQ** |
| **LOD** | **Limits of Detection** |
| **LOQ** | **Limits of Quantitation** |
| **M** | **Estimated Maximum Possible Concentration (CA Region 2 projects only)** |
| **NA** | **Not applicable** |
| **ND** | **Not Detected** |
| **Q** | **Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)** |
| **TEQ** | **Toxic Equivalency** |
| **U** | **Not Detected (specific projects only)** |
| ***** | **See Cover Letter** |

**Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.**

## Vista Analytical Laboratory Certifications

| Accrediting Authority | Certificate Number |
|---|---|
| Alaska Department of Environmental Conservation | 17-013 |
| Arkansas Department of Environmental Quality | 18-008-0 |
| California Department of Health – ELAP | 2892 |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005 | 3091.01 |
| Florida Department of Health | E87777 |
| Hawaii Department of Health | N/A |
| Louisiana Department of Environmental Quality | 01977 |
| Maine Department of Health | 2018017 |
| Michigan Department of Environmental Quality | 9932 |
| Minnesota Department of Health | 1322288 |
| New Hampshire Environmental Accreditation Program | 207718 |
| New Jersey Department of Environmental Protection | CA003 |
| New York Department of Health | 11411 |
| Oregon Laboratory Accreditation Program | 4042-009 |
| Pennsylvania Department of Environmental Protection | 015 |
| Texas Commission on Environmental Quality | T104704189-18-9 |
| Virginia Department of General Services | 9618 |
| Washington Department of Ecology | C584-18 |
| Wisconsin Department of Natural Resources | 998036160 |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

# NELAP Accredited Test Methods

| MATRIX: Air | |
|---|---|
| **Description of Test** | **Method** |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23 |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water | |
|---|---|
| **Description of Test** | **Method** |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS | EPA 522 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Dioxin by GC/HRMS | EPA 613 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids | |
|---|---|
| **Description of Test** | **Method** |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613 |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

# CHAIN OF CUSTODY RECORD

1803777
~~1803776~~ 1.4°C
KE 11/29/18

**LABORATORY:**
Vista Analytical
1104 Windfield Way, El Dorado Hills CA 95762
(916) 673-1520
Karen Volpendesta

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaroud Time X Standard □ Other
GeoTracker EDF required? □ Yes X No
LOCUS EDD required? □ Yes X No
Report Results to: □ RL X MDL
Report soil results to: □ wet weight (total) □ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**COC Number:**

Page 1 of 1

**SDG number:**

**PROJECT INFORMATION**

**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

ANALYSIS REQUESTED

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | Pesticides (EPA 1699) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|
| | TS2-I-181127 | 11/27/18 | 1636 | W | 3 | X | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | **Field Filtered (X):** | | | |
| Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | | 1 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks | CDIM | 11/27/18 / 1826 | Kim Earl | VA | 11/29/18 0810 |
| | | | | | |
| | | | | | |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 908 256 9230 |
| SAMPLERS SIGNATURE | | DATE / TIME | 11/27/1826 |

Vista Analytical Laboratory

# Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1803777 TAT Std

| | | | |
|---|---|---|---|
| Samples Arrival: | Date/Time 11/29/18 0810 | Initials: KE | Location: WR-2 Shelf/Rack: NA |
| Logged In: | Date/Time 11/29/18 0941 | Initials: KE | Location: WR-2 Shelf/Rack: A2/B2 |

| Delivered By: | FedEx | UPS | On Trac | GSO | DHL | Hand Delivered | Other |
|---|---|---|---|---|---|---|---|
| Preservation: | Ice | Blue Ice | | Dry Ice | | | None |

Temp °C: 1.5 (uncorrected) (+ MELTED ICE) Probe used: Y / N Thermometer ID: IR-4
Temp °C: 1.4 (corrected)

| | YES | NO | NA |
|---|---|---|---|
| Adequate Sample Volume Received? * SEE COMMENTS | ✓ | * ✓ | |
| Holding Time Acceptable? | ✓ | | |
| Shipping Container(s) Intact? | ✓ | | |
| Shipping Custody Seals Intact? | ✓ | | |
| Shipping Documentation Present? | ✓ | | |
| Airbill Trk # 7840 4099 5055 | ✓ | | |
| Sample Container Intact? * SEE COMMENTS | ✓ | * ✓ | |
| Sample Custody Seals Intact? | | | ✓ |
| Chain of Custody / Sample Documentation Present? | ✓ | | |
| COC Anomaly/Sample Acceptance Form completed? * SEE COMMENTS | ✓ | | |

| | | | | |
|---|---|---|---|---|
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? | | | | ✓ |
| Preservation Documented: | $Na_2S_2O_3$ Trizma None Other | Yes | No | NA |
| Shipping Container | Vista | Client | Retain | Return | Dispose |

Comments:
* RECEIVED AMBER SAMPLE CONTAINERS NOT WRAPPED IN BUBBLE WRAP & LAYING ON SIDES IN COOLER.
* ONE SAMPLE LID WAS BROKEN AND SAMPLE CONTAINER WAS SUBMERGED IN MELTED ICE & AQUEOUS SOLUTION.
KE 11/29/18

ID.: LR – SLC Rev No.: 3 Rev Date: 05 October 2018 Page: 1 of 1

# Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

| | | | |
|---|---|---|---|
| Client: | CDIM Engineering | Workorder Number: | 1803777 |
| Contact: | Scott Bourne | Date Received: | 29-Nov-18 08:10 |
| Email: | sab@cdimengineering.com | Documented by/date: | K. Elric 11/29/18 |
| Phone: | (415) 498-0535 | | |

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

**The following information or item is needed to proceed with analysis:**

- [ ] Complete Chain-of-Custody
- [ ] Test Method Requested
- [ ] Analyte List Requested
- [ ] Other:
- [ ] Preservative
- [ ] Sample Identification
- [ ] Sample Collection Date and/or Time
- [ ] Collector's Name
- [ ] Sample Type
- [ ] Sample Location

**The following anomalies were noted. Authorization is needed to proceed with analysis.**

- [ ] Temperature outside < 6°C Range — Samples Affected: ____________

Temperature ________°C  Ice Present? Yes No Melted

- [ ] Sample ID Discrepancy
- [ ] Sample Holding Time Missed
- [ ] Custody Seals Broken
- [ ] Insufficient Sample Size
- [X] Sample Container(s) Broken: See Comments
- [ ] Incorrect Container Type

**Comments:**
Received 3-1L Amber sample containers, labeled TS2-I-181127, two were received intact and one was received with volume lost due to broken lid.

**Client Authorization**

Proceed with Analysis: YES NO  Signature and Date 11/29/18

Client Comments/Instructions Per Bryan Starks, proceed using unbroken containers.

# ANALYTICAL REPORT

December 18, 2018

## CDIM Engineering - San Francisco, CA

| | |
|---|---|
| Sample Delivery Group: | L1050450 |
| Samples Received: | 12/06/2018 |
| Project Number: | 101-003, TASK 1 |
| Description: | LRTC 2018-2019 Industrial Stormwater |
| Site: | 402 WRIGHT AVE, RICHMOND, CA |
| Report To: | Mary Cunningham<br>45 Polk Street<br>3rd Floor<br>San Francisco, CA 94102 |

Entire Report Reviewed By:

Brian Ford
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

# TABLE OF CONTENTS

## TS1-E-181205 L1050450-01 WW

| Collected by | Collected date/time | Received date/time |
| --- | --- | --- |
| BS | 12/05/18 08:37 | 12/06/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
| --- | --- | --- | --- | --- | --- |
| Gravimetric Analysis by Method 2540 D-2011 | WG1207330 | 1 | 12/08/18 09:24 | 12/08/18 15:40 | AJS |
| Wet Chemistry by Method 1664A | WG1210508 | 1 | 12/12/18 06:18 | 12/13/18 17:30 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1207229 | 1 | 12/07/18 14:25 | 12/07/18 14:25 | MLW |
| Metals (ICPMS) by Method 200.8 | WG1207015 | 1 | 12/10/18 02:01 | 12/12/18 10:48 | LAT |

## TS2-E-181205 L1050450-02 WW

| Collected by | Collected date/time | Received date/time |
| --- | --- | --- |
| BS | 12/05/18 08:58 | 12/06/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
| --- | --- | --- | --- | --- | --- |
| Gravimetric Analysis by Method 2540 D-2011 | WG1207330 | 1 | 12/08/18 09:24 | 12/08/18 15:40 | AJS |
| Wet Chemistry by Method 1664A | WG1210508 | 1 | 12/12/18 06:18 | 12/13/18 17:30 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1207229 | 1 | 12/07/18 14:25 | 12/07/18 14:25 | MLW |
| Metals (ICPMS) by Method 200.8 | WG1207015 | 1 | 12/10/18 02:01 | 12/12/18 13:05 | LAT |

## TS3-E-181205 L1050450-03 WW

| Collected by | Collected date/time | Received date/time |
| --- | --- | --- |
| BS | 12/05/18 09:16 | 12/06/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
| --- | --- | --- | --- | --- | --- |
| Gravimetric Analysis by Method 2540 D-2011 | WG1207330 | 1 | 12/08/18 09:24 | 12/08/18 15:40 | AJS |
| Wet Chemistry by Method 1664A | WG1210508 | 1 | 12/12/18 06:18 | 12/13/18 17:30 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1207229 | 1 | 12/07/18 14:25 | 12/07/18 14:25 | MLW |
| Metals (ICPMS) by Method 200.8 | WG1207015 | 1 | 12/10/18 02:01 | 12/12/18 13:10 | LAT |

## TS4-E-181205 L1050450-04 WW

| Collected by | Collected date/time | Received date/time |
| --- | --- | --- |
| BS | 12/05/18 09:27 | 12/06/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
| --- | --- | --- | --- | --- | --- |
| Gravimetric Analysis by Method 2540 D-2011 | WG1207330 | 1 | 12/08/18 09:24 | 12/08/18 15:40 | AJS |
| Wet Chemistry by Method 1664A | WG1210508 | 1 | 12/12/18 06:18 | 12/13/18 17:30 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1207229 | 1 | 12/07/18 14:25 | 12/07/18 14:25 | MLW |
| Metals (ICPMS) by Method 200.8 | WG1207015 | 1 | 12/10/18 02:01 | 12/12/18 13:14 | LAT |

## TSX-E-181205 L1050450-05 WW

| Collected by | Collected date/time | Received date/time |
| --- | --- | --- |
| BS | 12/05/18 09:18 | 12/06/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
| --- | --- | --- | --- | --- | --- |
| Gravimetric Analysis by Method 2540 D-2011 | WG1207330 | 1 | 12/08/18 09:24 | 12/08/18 15:40 | AJS |
| Wet Chemistry by Method 1664A | WG1210508 | 1 | 12/12/18 06:18 | 12/13/18 17:30 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1212474 | 1 | 12/18/18 11:35 | 12/18/18 11:35 | MLW |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Project Manager

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 368 | 2630 | 1 | 12/08/2018 15:40 | WG1207330 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 788 | 5440 | 1 | 12/13/2018 17:30 | WG1210508 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.97 | T8 | 1 | 12/07/2018 14:25 | WG1207229 |

**Sample Narrative:**

L1050450-01 WG1207229: 7.97 at 13.7C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 51.1 | J | 20.0 | 100 | 1 | 12/12/2018 10:48 | WG1207015 |
| Iron | U | | 15.0 | 100 | 1 | 12/12/2018 10:48 | WG1207015 |
| Lead | 0.621 | J | 0.260 | 1.00 | 1 | 12/12/2018 10:48 | WG1207015 |
| Zinc | 22.6 | | 1.91 | 10.0 | 1 | 12/12/2018 10:48 | WG1207015 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 430 | J | 378 | 2700 | 1 | 12/08/2018 15:40 | WG1207330 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 763 | 5260 | 1 | 12/13/2018 17:30 | WG1210508 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.97 | T8 | 1 | 12/07/2018 14:25 | WG1207229 |

**Sample Narrative:**

L1050450-02 WG1207229: 7.97 at 14.5C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 26.1 | J | 20.0 | 100 | 1 | 12/12/2018 13:05 | WG1207015 |
| Copper | 7.39 | | 0.270 | 1.00 | 1 | 12/12/2018 13:05 | WG1207015 |
| Iron | 31.0 | J | 15.0 | 100 | 1 | 12/12/2018 13:05 | WG1207015 |
| Lead | 0.561 | J | 0.260 | 1.00 | 1 | 12/12/2018 13:05 | WG1207015 |
| Zinc | 29.4 | | 1.91 | 10.0 | 1 | 12/12/2018 13:05 | WG1207015 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 | 1 | 12/08/2018 15:40 | WG1207330 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 780 | 5380 | 1 | 12/13/2018 17:30 | WG1210508 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.24 | T8 | 1 | 12/07/2018 14:25 | WG1207229 |

**Sample Narrative:**

L1050450-03 WG1207229: 7.24 at 15.3C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 | 1 | 12/12/2018 13:10 | WG1207015 |
| Iron | U | | 15.0 | 100 | 1 | 12/12/2018 13:10 | WG1207015 |
| Lead | 1.50 | | 0.260 | 1.00 | 1 | 12/12/2018 13:10 | WG1207015 |
| Zinc | 40.6 | | 1.91 | 10.0 | 1 | 12/12/2018 13:10 | WG1207015 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 | 1 | 12/08/2018 15:40 | WG1207330 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 763 | 5260 | 1 | 12/13/2018 17:30 | WG1210508 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.54 | T8 | 1 | 12/07/2018 14:25 | WG1207229 |

**Sample Narrative:**

L1050450-04 WG1207229: 7.54 at 16C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 33.7 | J | 20.0 | 100 | 1 | 12/12/2018 13:14 | WG1207015 |
| Iron | U | | 15.0 | 100 | 1 | 12/12/2018 13:14 | WG1207015 |
| Lead | 0.456 | J | 0.260 | 1.00 | 1 | 12/12/2018 13:14 | WG1207015 |
| Zinc | 105 | | 1.91 | 10.0 | 1 | 12/12/2018 13:14 | WG1207015 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 600 | J | 350 | 2500 | 1 | 12/08/2018 15:40 | WG1207330 |

**Sample Narrative:**

L1050450-05 WG1207330: Duplicate analysis could not be performed due to holding time.

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 806 | 5560 | 1 | 12/13/2018 17:30 | WG1210508 |

**Sample Narrative:**

L1050450-05 WG1210508: Duplicate analysis not possible due to sample volume.

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.25 | T8 | 1 | 12/18/2018 11:35 | WG1212474 |

**Sample Narrative:**

L1050450-05 WG1212474: 7.25 at 11.9C

## Method Blank (MB)

(MB) R3366617-1 12/08/18 15:40

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 |

## L1050387-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1050387-01 12/08/18 15:40 • (DUP) R3366617-3 12/08/18 15:40

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 25300 | 27300 | 1 | 7.60 | P1 | 5 |

## L1050582-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1050582-01 12/08/18 15:40 • (DUP) R3366617-4 12/08/18 15:40

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 6000 | 5400 | 1 | 10.5 | P1 | 5 |

## Laboratory Control Sample (LCS)

(LCS) R3366617-2 12/08/18 15:40

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Suspended Solids | 773000 | 752000 | 97.3 | 85.0-115 | |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3368079-1 12/13/18 17:30

| Analyte | MB Result | MB Qualifier | MB MDL | MB RDL |
|---|---|---|---|---|
| | ug/l | | ug/l | ug/l |
| TPH - Oil & Grease | U | | 725 | 5000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3368079-2 12/13/18 17:30 • (LCSD) R3368079-3 12/13/18 17:30

| Analyte | Spike Amount | LCS Result | LCSD Result | LCS Rec. | LCSD Rec. | Rec. Limits | LCS Qualifier | LCSD Qualifier | RPD | RPD Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| | ug/l | ug/l | ug/l | % | % | % | | | % | % |
| TPH - Oil & Grease | 20000 | 14700 | 13300 | 73.5 | 66.5 | 64.0-132 | | | 10.0 | 18 |

## L1050330-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1050330-01 12/07/18 14:25 • (DUP) R3366294-3 12/07/18 14:25

| Analyte | Original Result | DUP Result | Dilution | DUP RPD | DUP Qualifier | DUP RPD Limits |
|---|---|---|---|---|---|---|
| | su | su | | % | | % |
| pH | 6.45 | 6.39 | 1 | 0.935 | | 1 |

Sample Narrative:

OS: 6.45 at 17C

DUP: 6.39 at 16.7C

## L1050667-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1050667-01 12/07/18 14:25 • (DUP) R3366294-4 12/07/18 14:25

| Analyte | Original Result | DUP Result | Dilution | DUP RPD | DUP Qualifier | DUP RPD Limits |
|---|---|---|---|---|---|---|
| | su | su | | % | | % |
| pH | 7.43 | 7.50 | 1 | 0.938 | | 1 |

Sample Narrative:

OS: 7.43 at 16.2C

DUP: 7.5 at 16.3C

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3366294-1 12/07/18 14:25 • (LCSD) R3366294-2 12/07/18 14:25

| Analyte | Spike Amount | LCS Result | LCSD Result | LCS Rec. | LCSD Rec. | Rec. Limits | LCS Qualifier | LCSD Qualifier | RPD | RPD Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| | su | su | su | % | % | % | | | % | % |
| pH | 10.0 | 9.92 | 9.93 | 99.2 | 99.3 | 99.0-101 | | | 0.101 | 1 |

Sample Narrative:

LCS: 9.92 at 19.2C

LCSD: 9.93 at 19C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## L1050450-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1050450-05 12/18/18 11:35 • (DUP) R3369118-2 12/18/18 11:35

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 7.25 | 7.21 | 1 | 0.553 | | 1 |

Sample Narrative:
OS: 7.25 at 11.9C
DUP: 7.21 at 11.7C

## Laboratory Control Sample (LCS)

(LCS) R3369118-1 12/18/18 11:35

| Analyte | Spike Amount su | LCS Result su | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| pH | 10.0 | 9.97 | 99.7 | 99.0-101 | |

Sample Narrative:
LCS: 9.97 at 17.2C

## Method Blank (MB)

(MB) R3367531-1 12/12/18 10:14

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 |
| Copper | U | | 0.270 | 1.00 |
| Iron | U | | 15.0 | 100 |
| Lead | U | | 0.260 | 1.00 |
| Zinc | U | | 1.91 | 10.0 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3367531-2 12/12/18 10:18 • (LCSD) R3367531-3 12/12/18 10:22

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 4810 | 4860 | 96.1 | 97.1 | 85.0-115 | | | 1.01 | 20 |
| Copper | 50.0 | 50.6 | 51.1 | 101 | 102 | 85.0-115 | | | 1.01 | 20 |
| Iron | 5000 | 5090 | 5170 | 102 | 103 | 85.0-115 | | | 1.56 | 20 |
| Lead | 50.0 | 49.3 | 49.8 | 98.7 | 99.6 | 85.0-115 | | | 0.980 | 20 |
| Zinc | 50.0 | 49.3 | 50.3 | 98.7 | 101 | 85.0-115 | | | 1.94 | 20 |

## L1050344-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050344-01 12/12/18 10:27 • (MS) R3367531-5 12/12/18 10:40 • (MSD) R3367531-6 12/12/18 10:44

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | U | 4750 | 4820 | 95.0 | 96.4 | 1 | 70.0-130 | | | 1.40 | 20 |
| Copper | 50.0 | 82.5 | 128 | 134 | 91.0 | 102 | 1 | 70.0-130 | | | 4.30 | 20 |
| Iron | 5000 | 351 | 5210 | 5380 | 97.2 | 101 | 1 | 70.0-130 | | | 3.19 | 20 |
| Lead | 50.0 | 0.320 | 48.9 | 50.7 | 97.2 | 101 | 1 | 70.0-130 | | | 3.47 | 20 |
| Zinc | 50.0 | 501 | 542 | 550 | 80.3 | 97.2 | 1 | 70.0-130 | | | 1.55 | 20 |

## L1050450-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050450-01 12/12/18 10:48 • (MS) R3367531-7 12/12/18 10:53 • (MSD) R3367531-8 12/12/18 10:57

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 51.1 | 4900 | 4850 | 97.0 | 96.0 | 1 | 70.0-130 | | | 1.05 | 20 |
| Copper | 50.0 | 2.19 | 51.1 | 52.4 | 97.9 | 100 | 1 | 70.0-130 | | | 2.47 | 20 |
| Iron | 5000 | U | 5030 | 5110 | 101 | 102 | 1 | 70.0-130 | | | 1.49 | 20 |
| Lead | 50.0 | 0.621 | 50.3 | 49.6 | 99.4 | 97.9 | 1 | 70.0-130 | | | 1.55 | 20 |
| Zinc | 50.0 | 22.6 | 74.3 | 75.1 | 104 | 105 | 1 | 70.0-130 | | | 1.03 | 20 |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |
| T8 | Sample(s) received past/too close to holding time expiration. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO00356 |
| Kentucky [1,6] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1,4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

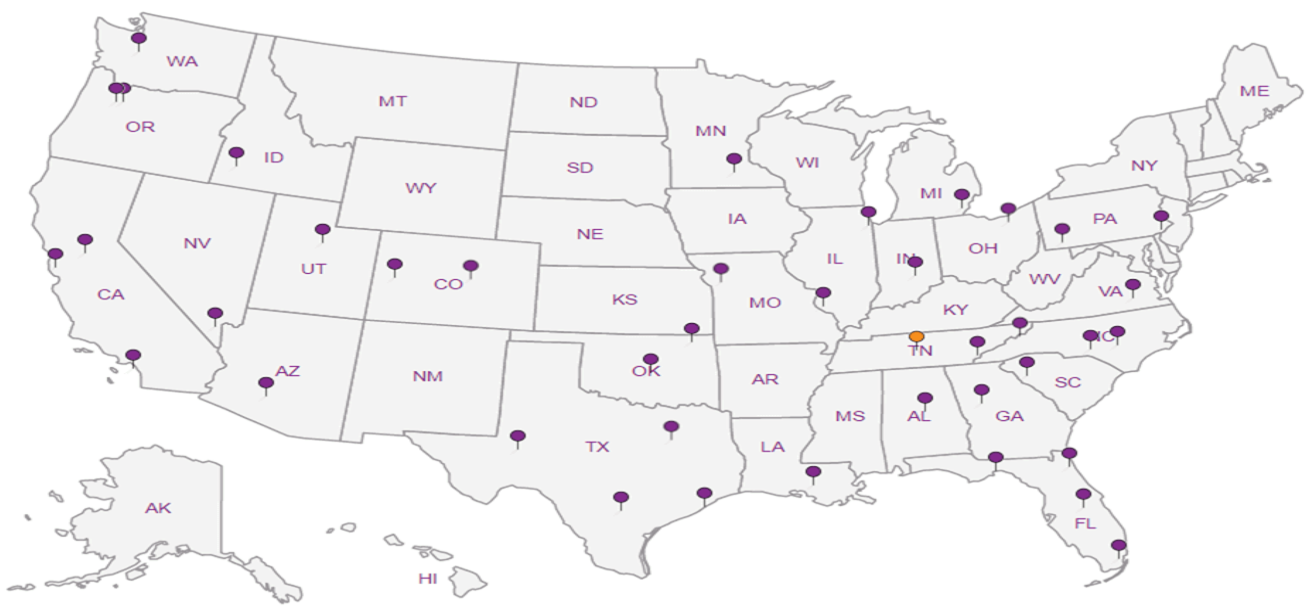
## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



CDIM ENGINEERING

G084

# CHAIN OF CUSTODY RECORD L1050450

**LABORATORY:**
ESC Laboratory
12065 Lebanon Road, Mt. Juliet, TN 37122
(615) 773-9772
Brian Ford

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaround Time X Standard ☐ Other
GeoTracker EDF required? ☐ Yes X No
LOCUS EDD required? ☐ Yes X No
Report Results to: ☐ RL X MDL
Report soil results to: ☐ wet weight (total) ☐ dry weight

Specify analytic/prep method and detection limit in report. Notify us of any anomalous peaks in GC or other scans. Call immediately with any questions or problems.

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**COC Number:**

Page 1 of 1

**SDG number:**

**PROJECT INFORMATION**
**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

ANALYSIS REQUESTED

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | pH (SM 4500HB) | Total Suspended Solids (SM 2540D) | Oil & Grease (EPA 1664A SGT-HEM) | Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS) ✓2 | Total Metals- Al, Cu, Fe, Pb, Zn (EPA 200.8 ICP-MS) ✓2 | | | | | | | | | | | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TS1-E-181205 | 12/5/18 | 837 | W | 5 | X | X | X | X | | | | | | | | | | | | -01 |
| | TS2-E-181205 | ↓ | 858 | W | 5 | X | X | X | | X | | | | | | | | | | | -02 |
| | TS3-E-181205 | | 916 | W | 5 | X | X | X | X | | | | | | | | | | | | -03 |
| | TS4-E-181205 | | 927 | W | 5 | X | X | X | X | | | | | | | | | | | | -04 |
| | TSX-E-181205 | | 918 | W | 5 | X | X | X | | | | | | | | | | | | | Perform MS/MSD using additional volume provided -05 |
| | | | LAST ENTRY | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| Field Filtered (X): | | | | | | | | | | | | | | | | | | | | | |
| Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | | 1 | 1 | 1, 3 | 1, 4 | 1, 4 | | | | | | | | | | | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

RAD SCREEN: <0.5 mR/hr

OK

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks | CDIM | 12/5/18 1200 | | | |
| | | | | | |
| | | | [signature] | PACE | 12/6/18 845 |

x = Samples released to a secured, locked area.
● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 808 256 9030 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 12/5/18 1200 |

[illegible] 12/6/18
1.1+.1=1.2

7824 4665 8800 4624 2994 7550 7529 tot 25

# Pace Analytical National Center for Testing & Innovation
## Cooler Receipt Form

| | | | |
|---|---|---|---|
| Client: CDI ENGSFCA | SDG# | L1050450 | |
| Cooler Received/Opened On 12 / 6 / 18 | Temperature: | 1.2 | |
| Received By: Kelsey Stephenson | | | |
| Signature: | | | |

| Receipt Check List | NP | Yes | No |
|---|---|---|---|
| COC Seal Present / Intact? | ✓ | | |
| COC Signed / Accurate? | | ✓ | |
| Bottles arrive intact? | | ✓ | |
| Correct bottles used? | | ✓ | |
| Sufficient volume sent? | | ✓ | |
| If Applicable | | | |
| VOA Zero headspace? | | | |
| Preservation Correct / Checked? | | ✓ | |

# ANALYTICAL REPORT

December 12, 2018

## CDIM Engineering - San Francisco, CA

| | |
|---|---|
| Sample Delivery Group: | L1050448 |
| Samples Received: | 12/06/2018 |
| Project Number: | 101-003, TASK 1 |
| Description: | LRTC 2018-2019 Industrial Stormwater |
| Site: | 402 WRIGHT AVE, RICHMOND, CA |
| Report To: | Mary Cunningham<br>45 Polk Street<br>3rd Floor<br>San Francisco, CA 94102 |

Entire Report Reviewed By:

Brian Ford
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

# TABLE OF CONTENTS

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 12/05/18 08:41 | 12/06/18 08:45 |

## TS1-I-181205 L1050448-01 WW

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1207330 | 1 | 12/08/18 09:24 | 12/08/18 15:40 | AJS |
| Wet Chemistry by Method 1664A | WG1209337 | 1 | 12/11/18 19:37 | 12/12/18 02:10 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1207229 | 1 | 12/07/18 14:25 | 12/07/18 14:25 | MLW |
| Metals (ICPMS) by Method 200.8 | WG1207015 | 1 | 12/10/18 02:01 | 12/12/18 12:48 | LAT |

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 12/05/18 09:01 | 12/06/18 08:45 |

## TS2-I-181205 L1050448-02 WW

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1207330 | 1 | 12/08/18 09:24 | 12/08/18 15:40 | AJS |
| Wet Chemistry by Method 1664A | WG1209337 | 1 | 12/11/18 19:37 | 12/12/18 02:10 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1207229 | 1 | 12/07/18 14:25 | 12/07/18 14:25 | MLW |
| Metals (ICPMS) by Method 200.8 | WG1207015 | 1 | 12/10/18 02:01 | 12/12/18 12:52 | LAT |

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 12/05/18 09:20 | 12/06/18 08:45 |

## TS3-I-181205 L1050448-03 WW

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1207330 | 1 | 12/08/18 09:24 | 12/08/18 15:40 | AJS |
| Wet Chemistry by Method 1664A | WG1209337 | 1 | 12/11/18 19:37 | 12/12/18 02:10 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1207229 | 1 | 12/07/18 14:25 | 12/07/18 14:25 | MLW |
| Metals (ICPMS) by Method 200.8 | WG1207015 | 1 | 12/10/18 02:01 | 12/12/18 12:57 | LAT |

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| BS | 12/05/18 09:29 | 12/06/18 08:45 |

## TS4-I-181205 L1050448-04 WW

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1207330 | 1 | 12/08/18 09:24 | 12/08/18 15:40 | AJS |
| Wet Chemistry by Method 1664A | WG1209337 | 1 | 12/11/18 19:37 | 12/12/18 02:10 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1207229 | 1 | 12/07/18 14:25 | 12/07/18 14:25 | MLW |
| Metals (ICPMS) by Method 200.8 | WG1207015 | 1 | 12/10/18 02:01 | 12/12/18 13:01 | LAT |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Project Manager

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 124000 | | 3500 | 25000 | 1 | 12/08/2018 15:40 | WG1207330 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 806 | 5560 | 1 | 12/12/2018 02:10 | WG1209337 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 8.10 | T8 | 1 | 12/07/2018 14:25 | WG1207229 |

**Sample Narrative:**

L1050448-01 WG1207229: 8.1 at 12.9C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 1700 | | 20.0 | 100 | 1 | 12/12/2018 12:48 | WG1207015 |
| Iron | 2920 | | 15.0 | 100 | 1 | 12/12/2018 12:48 | WG1207015 |
| Lead | 84.7 | | 0.260 | 1.00 | 1 | 12/12/2018 12:48 | WG1207015 |
| Zinc | 280 | | 1.91 | 10.0 | 1 | 12/12/2018 12:48 | WG1207015 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 56000 | | 3500 | 25000 | 1 | 12/08/2018 15:40 | WG1207330 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 797 | 5490 | 1 | 12/12/2018 02:10 | WG1209337 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.87 | T8 | 1 | 12/07/2018 14:25 | WG1207229 |

**Sample Narrative:**

L1050448-02 WG1207229: 7.87 at 12.8C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 592 | | 20.0 | 100 | 1 | 12/12/2018 12:52 | WG1207015 |
| Copper | 9.42 | | 0.270 | 1.00 | 1 | 12/12/2018 12:52 | WG1207015 |
| Iron | 1160 | | 15.0 | 100 | 1 | 12/12/2018 12:52 | WG1207015 |
| Lead | 9.87 | | 0.260 | 1.00 | 1 | 12/12/2018 12:52 | WG1207015 |
| Zinc | 85.4 | | 1.91 | 10.0 | 1 | 12/12/2018 12:52 | WG1207015 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 11300 | | 875 | 6250 | 1 | 12/08/2018 15:40 | WG1207330 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 771 | 5320 | 1 | 12/12/2018 02:10 | WG1209337 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.55 | T8 | 1 | 12/07/2018 14:25 | WG1207229 |

**Sample Narrative:**

L1050448-03 WG1207229: 7.55 at 13.5C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 478 | | 20.0 | 100 | 1 | 12/12/2018 12:57 | WG1207015 |
| Iron | 901 | | 15.0 | 100 | 1 | 12/12/2018 12:57 | WG1207015 |
| Lead | 31.7 | | 0.260 | 1.00 | 1 | 12/12/2018 12:57 | WG1207015 |
| Zinc | 73.0 | | 1.91 | 10.0 | 1 | 12/12/2018 12:57 | WG1207015 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 17400 | | 350 | 2500 | 1 | 12/08/2018 15:40 | WG1207330 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 763 | 5260 | 1 | 12/12/2018 02:10 | WG1209337 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.33 | T8 | 1 | 12/07/2018 14:25 | WG1207229 |

**Sample Narrative:**

L1050448-04 WG1207229: 7.33 at 13.5C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 600 | | 20.0 | 100 | 1 | 12/12/2018 13:01 | WG1207015 |
| Iron | 1270 | | 15.0 | 100 | 1 | 12/12/2018 13:01 | WG1207015 |
| Lead | 15.5 | | 0.260 | 1.00 | 1 | 12/12/2018 13:01 | WG1207015 |
| Zinc | 196 | | 1.91 | 10.0 | 1 | 12/12/2018 13:01 | WG1207015 |

## Method Blank (MB)

(MB) R3366617-1 12/08/18 15:40

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 |

## L1050387-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1050387-01 12/08/18 15:40 • (DUP) R3366617-3 12/08/18 15:40

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 25300 | 27300 | 1 | 7.60 | P1 | 5 |

## L1050582-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1050582-01 12/08/18 15:40 • (DUP) R3366617-4 12/08/18 15:40

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 6000 | 5400 | 1 | 10.5 | P1 | 5 |

## Laboratory Control Sample (LCS)

(LCS) R3366617-2 12/08/18 15:40

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Suspended Solids | 773000 | 752000 | 97.3 | 85.0-115 | |

## Method Blank (MB)

(MB) R3367298-1 12/12/18 02:10

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| TPH - Oil & Grease | U | | 725 | 5000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3367298-2 12/12/18 02:10 • (LCSD) R3367298-3 12/12/18 02:10

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 20000 | 19300 | 19200 | 96.5 | 96.0 | 64.0-132 | | | 0.519 | 18 |

## L1050330-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1050330-01 12/07/18 14:25 • (DUP) R3366294-3 12/07/18 14:25

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 6.45 | 6.39 | 1 | 0.935 | | 1 |

Sample Narrative:

OS: 6.45 at 17C

DUP: 6.39 at 16.7C

## L1050667-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1050667-01 12/07/18 14:25 • (DUP) R3366294-4 12/07/18 14:25

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 7.43 | 7.50 | 1 | 0.938 | | 1 |

Sample Narrative:

OS: 7.43 at 16.2C

DUP: 7.5 at 16.3C

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3366294-1 12/07/18 14:25 • (LCSD) R3366294-2 12/07/18 14:25

| Analyte | Spike Amount su | LCS Result su | LCSD Result su | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| pH | 10.0 | 9.92 | 9.93 | 99.2 | 99.3 | 99.0-101 | | | 0.101 | 1 |

Sample Narrative:

LCS: 9.92 at 19.2C

LCSD: 9.93 at 19C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3367531-1 12/12/18 10:14

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 |
| Copper | U | | 0.270 | 1.00 |
| Iron | U | | 15.0 | 100 |
| Lead | U | | 0.260 | 1.00 |
| Zinc | U | | 1.91 | 10.0 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3367531-2 12/12/18 10:18 • (LCSD) R3367531-3 12/12/18 10:22

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 4810 | 4860 | 96.1 | 97.1 | 85.0-115 | | | 1.01 | 20 |
| Copper | 50.0 | 50.6 | 51.1 | 101 | 102 | 85.0-115 | | | 1.01 | 20 |
| Iron | 5000 | 5090 | 5170 | 102 | 103 | 85.0-115 | | | 1.56 | 20 |
| Lead | 50.0 | 49.3 | 49.8 | 98.7 | 99.6 | 85.0-115 | | | 0.980 | 20 |
| Zinc | 50.0 | 49.3 | 50.3 | 98.7 | 101 | 85.0-115 | | | 1.94 | 20 |

## L1050344-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050344-01 12/12/18 10:27 • (MS) R3367531-5 12/12/18 10:40 • (MSD) R3367531-6 12/12/18 10:44

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | U | 4750 | 4820 | 95.0 | 96.4 | 1 | 70.0-130 | | | 1.40 | 20 |
| Copper | 50.0 | 82.5 | 128 | 134 | 91.0 | 102 | 1 | 70.0-130 | | | 4.30 | 20 |
| Iron | 5000 | 351 | 5210 | 5380 | 97.2 | 101 | 1 | 70.0-130 | | | 3.19 | 20 |
| Lead | 50.0 | 0.320 | 48.9 | 50.7 | 97.2 | 101 | 1 | 70.0-130 | | | 3.47 | 20 |
| Zinc | 50.0 | 501 | 542 | 550 | 80.3 | 97.2 | 1 | 70.0-130 | | | 1.55 | 20 |

## L1050450-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050450-01 12/12/18 10:48 • (MS) R3367531-7 12/12/18 10:53 • (MSD) R3367531-8 12/12/18 10:57

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 51.1 | 4900 | 4850 | 97.0 | 96.0 | 1 | 70.0-130 | | | 1.05 | 20 |
| Copper | 50.0 | 2.19 | 51.1 | 52.4 | 97.9 | 100 | 1 | 70.0-130 | | | 2.47 | 20 |
| Iron | 5000 | U | 5030 | 5110 | 101 | 102 | 1 | 70.0-130 | | | 1.49 | 20 |
| Lead | 50.0 | 0.621 | 50.3 | 49.6 | 99.4 | 97.9 | 1 | 70.0-130 | | | 1.55 | 20 |
| Zinc | 50.0 | 22.6 | 74.3 | 75.1 | 104 | 105 | 1 | 70.0-130 | | | 1.03 | 20 |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |
| T8 | Sample(s) received past/too close to holding time expiration. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO00356 |
| Kentucky [1,6] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1,4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

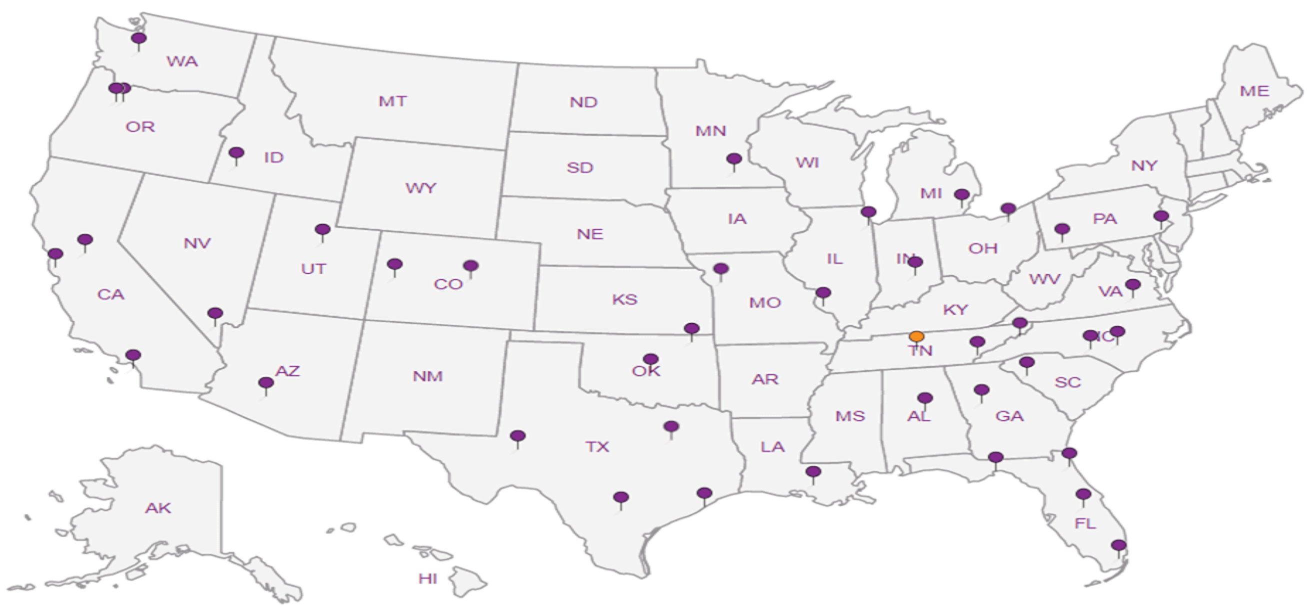
## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



G083

CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

L104 L1050448 L1049

**LABORATORY:**
ESC Laboratory
12065 Lebanon Road, Mt. Juliet, TN 37122
(615) 773-9772
Brian Ford

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaroud Time X Standard □ Other
GeoTracker EDF required? □ Yes X No
LOCUS EDD required? □ Yes X No
Report Results to: □ RL X MDL
Report soil results to: □ wet weight (total) □ dry weight

Specify analytic/prep method and detection limit in report. Notify us of any anomalous peaks in GC or other scans. Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**PROJECT INFORMATION**
**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

COC Number:
Page 1 of 1
SDG number:

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | pH (SM 4500HB) | Total Suspended Solids (SM 2540D) | Oil & Grease (EPA 1664A SGT-HEM) | Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS) | Total Metals- Al, Cu, Fe, Pb, Zn (EPA 200.8 ICP-MS) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TS1-I-181205 | 12/05/18 | 841 | W | 5 | X | X | X | X | | -01 |
| | TS2-I-181205 | ↓ | 901 | W | 5 | X | X | X | | X | -02 |
| | TS3-I-181205 | | 920 | W | 5 | X | X | X | X | | -03 |
| | TS4-I-181205 | | 929 | W | 5 | X | X | X | X | | -04 |
| **Field Filtered (X):** | | | | | | | | | | | |
| Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | | 1 | 1 | 1, 3 | 1, 4 | 1, 4 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

RAD SCREEN: <0.5 mR/hr

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks | CDIM | 12/5/18 1200 | | | OK |
| | | | | | |
| | | | [signature] | PACE | 12/6/18 845 |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | |
|---|---|
| SAMPLERS NAME | Bryan Starks |
| SAMPLERS SIGNATURE | [signature] |
| MOBILE # | 808 256 9250 |
| DATE / TIME | 12/5/18 1200 |

1.1 + .1 = 1.2

4624 2994 7550
7529 tot = 20

# Pace Analytical National Center for Testing & Innovation
## Cooler Receipt Form

| | | | |
|---|---|---|---|
| Client: CDIENGSFCA | SDG# | L1049 | |
| Cooler Received/Opened On: 12/6/18 | Temperature: | 1.2 | |
| Received By: Kelsey Stephenson | | L1050448 | |
| Signature: | | | |

| Receipt Check List | NP | Yes | No |
|---|---|---|---|
| COC Seal Present / Intact? | ✓ | | |
| COC Signed / Accurate? | | ✓ | |
| Bottles arrive intact? | | ✓ | |
| Correct bottles used? | | ✓ | |
| Sufficient volume sent? | | ✓ | |
| If Applicable | | | |
| VOA Zero headspace? | | | |
| Preservation Correct / Checked? | | ✓ | |

January 07, 2019

**Vista Work Order No. 1803932**

Mr. Scott Bourne
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, CA 94102

Dear Mr. Bourne,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on December 06, 2018 under your Project Name 'LRTC 18-19 Industrial Stormwater 101-003 Task 1'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.*

Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

**Vista Work Order No. 1803932**
**Case Narrative**

**Sample Condition on Receipt:**

One sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The sample bottle labels were difficult to read. The client was notified by email, December 11, 2018. The sample was logged with the sample ID on the Chain of Custody form.

**Analytical Notes:**

**EPA Method 1699**

The sample was extracted and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

Holding Times

The sample was extracted and analyzed within the method hold times. The sample was re-extracted past hold times to report only 4,4'-DDD.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with each preparation batch. No other analytes were detected above the sample quantitation limits in the Method Blanks. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside the method acceptance criteria are listed in the table below:

QC Anomalies

| LabNumber | SampleName | Analysis | Analyte | Flag | %Rec |
|---|---|---|---|---|---|
| 1803932-01 | TS2-E-181205 | EPA Method 1699 | 13C12-4,4'-DDE | H | 41.0 |
| 1803932-01 | TS2-E-181205 | EPA Method 1699 | 13C12-Dieldrin | H | 37.5 |
| 1803932-01 | TS2-E-181205 | EPA Method 1699 | 13C10-cis-Nonachlor | H | 29.2 |

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

# Sample Inventory Report

| Vista Sample ID | Client Sample ID | Sampled | Received | Components/Containers |
|---|---|---|---|---|
| 1803932-01 | TS2-E-181205 | 05-Dec-18 08:58 | 06-Dec-18 07:48 | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |

Vista Project: 1803932 Client Project: LRTC 18-19 Industrial Stormwater 101-003 Task 1

## ANALYTICAL RESULTS

| **Sample ID:** | **Method Blank** | | **EPA Method 1699** |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B8L0069 | Lab Sample: | B8L0069-BLK1 |
| Sample Size: | 1.00 L | Date Extracted: | 10-Dec-2018 14:00 | Date Analyzed: | 12-Dec-18 16:09 Column: ZB-50 |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 6.89 | | | J |
| alpha-BHC | ND | 4.50 | | |
| Lindane (gamma-BHC) | ND | 7.65 | | |
| beta-BHC | ND | 6.70 | | |
| delta-BHC | ND | 5.18 | | |
| Heptachlor | ND | 13.4 | | |
| Aldrin | ND | 5.52 | | |
| Oxychlordane | ND | 17.2 | | |
| cis-Heptachlor Epoxide | ND | 13.6 | | |
| trans-Heptachlor Epoxide | ND | 48.2 | | |
| trans-Chlordane (gamma) | ND | 13.9 | | |
| trans-Nonachlor | ND | 12.8 | | |
| cis-Chlordane (alpha) | ND | 12.9 | | |
| Endosulfan I (alpha) | ND | 17.6 | | |
| 2,4'-DDE | ND | 2.84 | | |
| 4,4'-DDE | ND | 3.86 | | |
| Dieldrin | ND | 1.90 | | |
| Endrin | ND | 3.56 | | |
| cis-Nonachlor | ND | 2.96 | | |
| Endosulfan II (beta) | ND | 10.4 | | |
| 2,4'-DDD | ND | 4.16 | | |
| 2,4'-DDT | ND | 7.11 | | |
| 4,4'-DDT | ND | 8.20 | | |
| Endosulfan Sulfate | ND | 16.3 | | |
| 4,4'-Methoxychlor | ND | 4.44 | | |
| Mirex | ND | 4.28 | | |
| Endrin Aldehyde | ND | 11.1 | | |
| Endrin Ketone | ND | 12.2 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 53.3 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 75.5 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 79.2 | 11 - 120 | |
| IS | 13C6-beta-BHC | 81.9 | 32 - 130 | |
| IS | 13C6-delta-BHC | 84.2 | 36 - 137 | |
| IS | 13C10-Heptachlor | 78.7 | 5 - 120 | |
| IS | 13C12-Aldrin | 78.0 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 90.3 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 94.0 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 87.2 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 87.9 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 88.0 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 101 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 100 | 47 - 160 | |
| IS | 13C12-Dieldrin | 92.1 | 40 - 151 | |
| IS | 13C12-Endrin | 119 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 99.8 | 36 - 139 | |
| IS | 13C9-Endosulfan II (beta) | 95.9 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 94.1 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 92.1 | 5 - 199 | |
| IS | 13C12-4,4'-DDT | 105 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 105 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 116 | 5 - 120 | |
| IS | 13C10-Mirex | 116 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 47.2 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 102 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

## Sample ID: OPR

## EPA Method 1699

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B8L0069 | Lab Sample: | B8L0069-BS1 |
| Sample Size: | 1.00 L | Date Extracted: | 10-Dec-2018 14:00 | Date Analyzed: | 12-Dec-18 13:42 Column: ZB-50 |

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits |
|---|---|---|---|---|
| Hexachlorobenzene | 1020 | 1000 | 102 | 50 - 120 |
| alpha-BHC | 985 | 1000 | 98.5 | 50 - 120 |
| Lindane (gamma-BHC) | 1000 | 1000 | 100 | 50 - 120 |
| beta-BHC | 984 | 1000 | 98.4 | 50 - 120 |
| delta-BHC | 989 | 1000 | 98.9 | 50 - 120 |
| Heptachlor | 982 | 1000 | 98.2 | 50 - 120 |
| Aldrin | 1010 | 1000 | 101 | 50 - 120 |
| Oxychlordane | 978 | 1000 | 97.8 | 50 - 120 |
| cis-Heptachlor Epoxide | 946 | 1000 | 94.6 | 50 - 120 |
| trans-Heptachlor Epoxide | 921 | 1000 | 92.1 | 50 - 120 |
| trans-Chlordane (gamma) | 999 | 1000 | 99.9 | 50 - 120 |
| trans-Nonachlor | 994 | 1000 | 99.4 | 50 - 120 |
| cis-Chlordane (alpha) | 1110 | 1000 | 111 | 50 - 120 |
| Endosulfan I (alpha) | 953 | 1000 | 95.3 | 50 - 120 |
| 2,4'-DDE | 987 | 1000 | 98.7 | 24 - 123 |
| 4,4'-DDE | 1040 | 1000 | 104 | 50 - 120 |
| Dieldrin | 953 | 1000 | 95.3 | 50 - 120 |
| Endrin | 915 | 1000 | 91.5 | 50 - 120 |
| cis-Nonachlor | 939 | 1000 | 93.9 | 50 - 120 |
| Endosulfan II (beta) | 994 | 1000 | 99.4 | 5 - 200 |
| 2,4'-DDD | 985 | 1000 | 98.5 | 50 - 120 |
| 2,4'-DDT | 1070 | 1000 | 107 | 50 - 120 |
| 4,4'-DDT | 993 | 1000 | 99.3 | 50 - 120 |
| Endosulfan Sulfate | 865 | 1000 | 86.5 | 50 - 120 |
| 4,4'-Methoxychlor | 984 | 1000 | 98.4 | 50 - 120 |
| Mirex | 1020 | 1000 | 102 | 50 - 120 |
| Endrin Aldehyde | 902 | 1000 | 90.2 | 50 - 134 |
| Endrin Ketone | 861 | 1000 | 86.1 | 50 - 134 |

| | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 55.9 | 5 - 120 |
| IS | 13C6-alpha-BHC | 75.8 | 17 - 141 |
| IS | 13C6-Lindane (gamma-BHC) | 76.5 | 5 - 124 |
| IS | 13C6-beta-BHC | 79.0 | 17 - 141 |
| IS | 13C6-delta-BHC | 78.5 | 16 - 150 |
| IS | 13C10-Heptachlor | 68.5 | 5 - 128 |
| IS | 13C12-Aldrin | 73.1 | 5 - 126 |
| IS | 13C10-Oxychlordane | 80.0 | 5 - 144 |
| IS | 13C10-cis-Heptachlor Epoxide | 85.0 | 8 - 146 |
| IS | 13C10-trans-Chlordane (gamma) | 80.0 | 15 - 144 |
| IS | 13C10-trans-Nonachlor | 78.5 | 13 - 149 |
| IS | 13C9-Endosulfan I (alpha) | 83.9 | 5 - 144 |
| IS | 13C12-2,4'-DDE | 95.9 | 26 - 169 |
| IS | 13C12-4,4'-DDE | 92.6 | 26 - 169 |
| IS | 13C12-Dieldrin | 87.1 | 19 - 161 |
| IS | 13C12-Endrin | 113 | 20 - 157 |
| IS | 13C10-cis-Nonachlor | 93.5 | 17 - 154 |
| IS | 13C9-Endosulfan II (beta) | 81.2 | 5 - 120 |
| IS | 13C12-2,4'-DDD | 85.8 | 14 - 200 |
| IS | 13C12-2,4'-DDT | 82.5 | 14 - 200 |
| IS | 13C12-4,4'-DDT | 95.4 | 13 - 200 |
| IS | 13C9-Endosulfan Sulfate | 95.6 | 5 - 144 |
| IS | 13C12-Methoxychlor | 107 | 8 - 200 |
| IS | 13C10-Mirex | 114 | 5 - 138 |
| IS | 13C12-Endrin Aldehyde | 40.7 | 5 - 144 |
| IS | 13C12-Endrin Ketone | 91.7 | 5 - 144 |

LCL-UCL - Lower control limit - upper control limit

| Sample ID: Method Blank | | | | | EPA Method 1699 | | | |
|---|---|---|---|---|---|---|---|---|
| Matrix: Aqueous | | QC Batch: B8L0132 | | | Lab Sample: B8L0132-BLK1 | | | |
| Sample Size: 1.00 L | | Date Extracted: 16-Dec-2018 8:31 | | | Date Analyzed: 19-Dec-18 03:14 Column: ZB-50 | | | |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | ND | 1.96 | | | IS 13C12-4,4'-DDD | 64.3 | 5 - 120 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

## Sample ID: OPR

## EPA Method 1699

| | | | |
|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B8L0132 |
| Sample Size: | 1.00 L | Date Extracted: | 16-Dec-2018 8:31 |
| Lab Sample: | B8L0132-BS1 | | |
| Date Analyzed: | 18-Dec-18 23:10 Column: ZB-50 | | |

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits | | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 997 | 1000 | 99.7 | 42 - 120 | IS | 13C12-4,4'-DDD | 80.1 | 14 - 200 |

LCL-UCL - Lower control limit - upper control limit

## Sample ID: TS2-E-181205 — EPA Method 1699

| Client Data | | Sample Data | | Laboratory Data | | | |
|---|---|---|---|---|---|---|---|
| Name: | CDIM Engineering | Matrix: | Water | Lab Sample: | 1803932-01 | Date Received: | 06-Dec-2018 7:48 |
| Project: | LRTC 18-19 Industrial Stormwater 101-003 Ta | Sample Size: | 1.01 L | QC Batch: | B8L0069 | Date Extracted: | 10-Dec-2018 14:00 |
| Date Collected: | 05-Dec-2018 8:58 | | | Date Analyzed: | 13-Dec-18 06:53 Column: ZB-50 | | |
| | | | | | 19-Dec-18 22:59 Column: ZB-50 | | |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 13.3 | | | J, B |
| alpha-BHC | 70.2 | | | |
| Lindane (gamma-BHC) | 42.7 | | | |
| beta-BHC | 55.7 | | | |
| delta-BHC | ND | 2.20 | | |
| Heptachlor | ND | 6.74 | | |
| Aldrin | ND | 5.62 | | |
| Oxychlordane | ND | 24.8 | | |
| cis-Heptachlor Epoxide | ND | | 89.7 | |
| trans-Heptachlor Epoxide | ND | 53.2 | | |
| trans-Chlordane (gamma) | ND | 25.0 | | |
| trans-Nonachlor | ND | 26.8 | | |
| cis-Chlordane (alpha) | 130 | | | |
| Endosulfan I (alpha) | ND | 35.8 | | |
| 2,4'-DDE | ND | 4.17 | | |
| 4,4'-DDE | 62.9 | | | |
| Dieldrin | 1080 | | | |
| Endrin | 294 | | | |
| cis-Nonachlor | ND | 45.4 | | |
| Endosulfan II (beta) | ND | 154 | | |
| 2,4'-DDD | 75.3 | | | |
| 2,4'-DDT | 36.0 | | | J |
| 4,4'-DDD | 106 | | | |
| 4,4'-DDT | 87.4 | | | |
| Endosulfan Sulfate | ND | 170 | | |
| 4,4'-Methoxychlor | ND | 107 | | |
| Mirex | ND | 55.8 | | |
| Endrin Aldehyde | ND | 66.6 | | |
| Endrin Ketone | 573 | | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 73.1 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 88.3 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 79.2 | 11 - 120 | |
| IS | 13C6-beta-BHC | 75.9 | 32 - 130 | |
| IS | 13C6-delta-BHC | 73.6 | 36 - 137 | |
| IS | 13C10-Heptachlor | 64.7 | 5 - 120 | |
| IS | 13C12-Aldrin | 60.4 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 55.4 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 66.7 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 46.9 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 39.9 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 42.1 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 54.0 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 41.0 | 47 - 160 | H |
| IS | 13C12-Dieldrin | 37.5 | 40 - 151 | H |
| IS | 13C12-Endrin | 38.9 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 29.2 | 36 - 139 | H |
| IS | 13C9-Endosulfan II (beta) | 33.0 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 34.1 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 19.3 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 68.4 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 17.5 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 30.1 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 17.5 | 5 - 120 | |
| IS | 13C10-Mirex | 13.4 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 17.0 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 17.0 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

# DATA QUALIFIERS & ABBREVIATIONS

| | |
|---|---|
| **B** | **This compound was also detected in the method blank** |
| **Conc.** | **Concentration** |
| **D** | **Dilution** |
| **DL** | **Detection limit** |
| **E** | **The associated compound concentration exceeded the calibration range of the instrument** |
| **H** | **Recovery and/or RPD was outside laboratory acceptance limits** |
| **I** | **Chemical Interference** |
| **J** | **The amount detected is below the Reporting Limit/LOQ** |
| **LOD** | **Limits of Detection** |
| **LOQ** | **Limits of Quantitation** |
| **M** | **Estimated Maximum Possible Concentration (CA Region 2 projects only)** |
| **NA** | **Not applicable** |
| **ND** | **Not Detected** |
| **Q** | **Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)** |
| **TEQ** | **Toxic Equivalency** |
| **U** | **Not Detected (specific projects only)** |
| ***** | **See Cover Letter** |

**Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.**

## Vista Analytical Laboratory Certifications

| Accrediting Authority | Certificate Number |
|---|---|
| Alaska Department of Environmental Conservation | 17-013 |
| Arkansas Department of Environmental Quality | 18-008-0 |
| California Department of Health – ELAP | 2892 |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005 | 3091.01 |
| Florida Department of Health | E87777 |
| Hawaii Department of Health | N/A |
| Louisiana Department of Environmental Quality | 01977 |
| Maine Department of Health | 2018017 |
| Michigan Department of Environmental Quality | 9932 |
| Minnesota Department of Health | 1322288 |
| New Hampshire Environmental Accreditation Program | 207718 |
| New Jersey Department of Environmental Protection | CA003 |
| New York Department of Health | 11411 |
| Oregon Laboratory Accreditation Program | 4042-009 |
| Pennsylvania Department of Environmental Protection | 015 |
| Texas Commission on Environmental Quality | T104704189-18-9 |
| Virginia Department of General Services | 9618 |
| Washington Department of Ecology | C584-18 |
| Wisconsin Department of Natural Resources | 998036160 |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

# NELAP Accredited Test Methods

| MATRIX: Air | |
|---|---|
| **Description of Test** | **Method** |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23 |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water | |
|---|---|
| **Description of Test** | **Method** |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS | EPA 522 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Dioxin by GC/HRMS | EPA 613 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids | |
|---|---|
| **Description of Test** | **Method** |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613 |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

## CHAIN OF CUSTODY RECORD

1803932 1.2°C

**LABORATORY:**
Vista Analytical
1104 Windfield Way, El Dorado Hills CA 95762
(916) 673-1520
Karen Volpendesta

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaround Time X Standard □ Other
GeoTracker EDF required? □ Yes X No
LOCUS EDD required? □ Yes X No
Report Results to: □ RL X MDL
Report soil results to: □ wet weight (total) □ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**PROJECT INFORMATION**

**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

ANALYSIS REQUESTED

COC Number:
Page ____ of ____
SDG number:

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | Pesticides (EPA 1699) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|
| | TS2-E-181205 | 12/5/18 | 858 | W | 3 | X | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Field Filtered (X): | | | | | | | |
| Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other ____ | | | | | | 1 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks | CDIM | 12/5/18 1200 | B Benedict | VAL | 12/6/18 0748 |
| | | | | | |
| | | | | | |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 908 256 9230 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 12/5/18 1200 |

Vista Analytical Laboratory

# Sample Log-In Checklist

WWS 12/06/18

Page # 1 of 1

Vista Work Order #: ~~1803931~~ ~~1804~~ 1803932 TAT Std

| | | | |
|---|---|---|---|
| **Samples Arrival:** | **Date/Time** 12/6/18 0748 | **Initials:** BSB | **Location:** WR-2 **Shelf/Rack:** NA |
| **Logged In:** | **Date/Time** 12/06/18 1436 | **Initials:** WWS | **Location:** WR-2 **Shelf/Rack:** B-2, D-6 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Delivered By:** | FedEx | UPS | On Trac | GSO | DHL | Hand Delivered | Other |
| **Preservation:** | Ice | Blue Ice | | Dry Ice | | None | |

| | | |
|---|---|---|
| **Temp °C:** 1.3 **(uncorrected)** | **Probe used: Y / N** | **Thermometer ID:** IR-4 |
| **Temp °C:** 1.2 **(corrected)** | | |

| | YES | NO | NA |
|---|---|---|---|
| Adequate Sample Volume Received? | ✓ | | |
| Holding Time Acceptable? | ✓ | | |
| Shipping Container(s) Intact? | ✓ | | |
| Shipping Custody Seals Intact? | | | ✓ |
| Shipping Documentation Present? | ✓ | | |
| Airbill / Trk # 7842 1591 3965 | ✓ | | |
| Sample Container Intact? | ✓ | | |
| Sample Custody Seals Intact? | | | ✓ |
| Chain of Custody / Sample Documentation Present? | ✓ | | |
| COC Anomaly/Sample Acceptance Form completed? | * ✓ | | |

| | | | | |
|---|---|---|---|---|
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? | | | | ✓ |
| Preservation Documented: | $Na_2S_2O_3$ Trizma None Other | Yes | No | NA |

| | | | | | |
|---|---|---|---|---|---|
| Shipping Container | Vista | Client | Retain | Return | Dispose |

*Comments:* * sample labels on bottles received very hard to read. "26" written on caps.

# Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

| | | | |
|---|---|---|---|
| Client: | CDIM Engineering | Workorder Number: | 1803932 |
| Contact: | Scott Bourne | Date Received: | 06-Dec-18 07:48 |
| Email: | sab@cdimengineering.com | Documented by/date: | MSparks/12-06-18 |
| Phone: | (415) 498-0535 | | |

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

**The following information or item is needed to proceed with analysis:**

- [ ] Complete Chain-of-Custody
- [ ] Test Method Requested
- [ ] Analyte List Requested
- [ ] Other:
- [ ] Preservative
- [X] Sample Identification: **see comments**
- [ ] Sample Collection Date and/or Time
- [ ] Collector's Name
- [ ] Sample Type
- [ ] Sample Location

**The following anomalies were noted. Authorization is needed to proceed with analysis.**

- [ ] Temperature outside < 6°C Range — Samples Affected: ____

Temperature ______ °C   Ice Present?   Yes   No   Melted

- [ ] Sample ID Discrepancy
- [ ] Sample Holding Time Missed
- [ ] Custody Seals Broken
- [ ] Insufficient Sample Size
- [ ] Sample Container(s) Broken
- [ ] Incorrect Container Type

**Comments:**

Sample labels are illegible on bottles.

**Client Authorization**

Proceed with Analysis: YES NO   Signature and Date [signature] 12/11/18

Client Comments/Instructions Client notified via email 12/11/18.

January 07, 2019

**Vista Work Order No. 1803930**

Mr. Scott Bourne
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, CA 94102

Dear Mr. Bourne,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on December 06, 2018 under your Project Name 'LRTC 18-19 Industrial Stormwater 101-003 Task 1'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

**Vista Work Order No. 1803930**
**Case Narrative**

**Sample Condition on Receipt:**

One water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The sample bottle labels were difficult to read. The client was notified by email, December 11, 2018. The sample was logged with the sample ID on the Chain of Custody form.

**Analytical Notes:**

**EPA Method 1699**

The sample was extracted and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

Holding Times

The sample was extracted and analyzed within the method hold times. The sample was re-extracted past hold times to report only 4,4'-DDD.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with each preparation batch. No other analytes were detected above the sample quantitation limits in the Method Blanks. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside the method acceptance criteria are listed in the table below:

QC Anomalies

| LabNumber | SampleName | Analysis | Analyte | Flag | %Rec |
|---|---|---|---|---|---|
| 1803930-01 | TS2-I-181205 | EPA Method 1699 | 13C12-2,4'-DDE | H | 42.9 |
| 1803930-01 | TS2-I-181205 | EPA Method 1699 | 13C12-4,4'-DDE | H | 31.1 |
| 1803930-01 | TS2-I-181205 | EPA Method 1699 | 13C12-Dieldrin | H | 28.6 |
| 1803930-01 | TS2-I-181205 | EPA Method 1699 | 13C10-cis-Nonachlor | H | 20.9 |
| 1803930-01 | TS2-I-181205 | EPA Method 1699 | 13C12-Endrin Aldehyde | H | 14.6 |
| 1803930-01 | TS2-I-181205 | EPA Method 1699 | 13C12-Endrin Ketone | H | 11.7 |

H = Recovery was outside laboratory acceptance criteria.

# TABLE OF CONTENTS

# Sample Inventory Report

| Vista Sample ID | Client Sample ID | Sampled | Received | Components/Containers |
|---|---|---|---|---|
| 1803930-01 | TS2-I-181205 | 05-Dec-18 09:01 | 06-Dec-18 07:48 | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |

# ANALYTICAL RESULTS

## Sample ID: Method Blank — EPA Method 1699

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B8L0069 | Lab Sample: | B8L0069-BLK1 |
| Sample Size: | 1.00 L | Date Extracted: | 10-Dec-2018 14:00 | Date Analyzed: | 12-Dec-18 16:09 Column: ZB-50 |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 6.89 | | | J |
| alpha-BHC | ND | 4.50 | | |
| Lindane (gamma-BHC) | ND | 7.65 | | |
| beta-BHC | ND | 6.70 | | |
| delta-BHC | ND | 5.18 | | |
| Heptachlor | ND | 13.4 | | |
| Aldrin | ND | 5.52 | | |
| Oxychlordane | ND | 17.2 | | |
| cis-Heptachlor Epoxide | ND | 13.6 | | |
| trans-Heptachlor Epoxide | ND | 48.2 | | |
| trans-Chlordane (gamma) | ND | 13.9 | | |
| trans-Nonachlor | ND | 12.8 | | |
| cis-Chlordane (alpha) | ND | 12.9 | | |
| Endosulfan I (alpha) | ND | 17.6 | | |
| 2,4'-DDE | ND | 2.84 | | |
| 4,4'-DDE | ND | 3.86 | | |
| Dieldrin | ND | 1.90 | | |
| Endrin | ND | 3.56 | | |
| cis-Nonachlor | ND | 2.96 | | |
| Endosulfan II (beta) | ND | 10.4 | | |
| 2,4'-DDD | ND | 4.16 | | |
| 2,4'-DDT | ND | 7.11 | | |
| 4,4'-DDT | ND | 8.20 | | |
| Endosulfan Sulfate | ND | 16.3 | | |
| 4,4'-Methoxychlor | ND | 4.44 | | |
| Mirex | ND | 4.28 | | |
| Endrin Aldehyde | ND | 11.1 | | |
| Endrin Ketone | ND | 12.2 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 53.3 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 75.5 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 79.2 | 11 - 120 | |
| IS | 13C6-beta-BHC | 81.9 | 32 - 130 | |
| IS | 13C6-delta-BHC | 84.2 | 36 - 137 | |
| IS | 13C10-Heptachlor | 78.7 | 5 - 120 | |
| IS | 13C12-Aldrin | 78.0 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 90.3 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 94.0 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 87.2 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 87.9 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 88.0 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 101 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 100 | 47 - 160 | |
| IS | 13C12-Dieldrin | 92.1 | 40 - 151 | |
| IS | 13C12-Endrin | 119 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 99.8 | 36 - 139 | |
| IS | 13C9-Endosulfan II (beta) | 95.9 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 94.1 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 92.1 | 5 - 199 | |
| IS | 13C12-4,4'-DDT | 105 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 105 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 116 | 5 - 120 | |
| IS | 13C10-Mirex | 116 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 47.2 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 102 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

## Sample ID: OPR

## EPA Method 1699

Matrix: Aqueous
Sample Size: 1.00 L

QC Batch: B8L0069
Date Extracted: 10-Dec-2018 14:00

Lab Sample: B8L0069-BS1
Date Analyzed: 12-Dec-18 13:42 Column: ZB-50

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits |
|---|---|---|---|---|
| Hexachlorobenzene | 1020 | 1000 | 102 | 50 - 120 |
| alpha-BHC | 985 | 1000 | 98.5 | 50 - 120 |
| Lindane (gamma-BHC) | 1000 | 1000 | 100 | 50 - 120 |
| beta-BHC | 984 | 1000 | 98.4 | 50 - 120 |
| delta-BHC | 989 | 1000 | 98.9 | 50 - 120 |
| Heptachlor | 982 | 1000 | 98.2 | 50 - 120 |
| Aldrin | 1010 | 1000 | 101 | 50 - 120 |
| Oxychlordane | 978 | 1000 | 97.8 | 50 - 120 |
| cis-Heptachlor Epoxide | 946 | 1000 | 94.6 | 50 - 120 |
| trans-Heptachlor Epoxide | 921 | 1000 | 92.1 | 50 - 120 |
| trans-Chlordane (gamma) | 999 | 1000 | 99.9 | 50 - 120 |
| trans-Nonachlor | 994 | 1000 | 99.4 | 50 - 120 |
| cis-Chlordane (alpha) | 1110 | 1000 | 111 | 50 - 120 |
| Endosulfan I (alpha) | 953 | 1000 | 95.3 | 50 - 120 |
| 2,4'-DDE | 987 | 1000 | 98.7 | 24 - 123 |
| 4,4'-DDE | 1040 | 1000 | 104 | 50 - 120 |
| Dieldrin | 953 | 1000 | 95.3 | 50 - 120 |
| Endrin | 915 | 1000 | 91.5 | 50 - 120 |
| cis-Nonachlor | 939 | 1000 | 93.9 | 50 - 120 |
| Endosulfan II (beta) | 994 | 1000 | 99.4 | 5 - 200 |
| 2,4'-DDD | 985 | 1000 | 98.5 | 50 - 120 |
| 2,4'-DDT | 1070 | 1000 | 107 | 50 - 120 |
| 4,4'-DDT | 993 | 1000 | 99.3 | 50 - 120 |
| Endosulfan Sulfate | 865 | 1000 | 86.5 | 50 - 120 |
| 4,4'-Methoxychlor | 984 | 1000 | 98.4 | 50 - 120 |
| Mirex | 1020 | 1000 | 102 | 50 - 120 |
| Endrin Aldehyde | 902 | 1000 | 90.2 | 50 - 134 |
| Endrin Ketone | 861 | 1000 | 86.1 | 50 - 134 |

| | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 55.9 | 5 - 120 |
| IS | 13C6-alpha-BHC | 75.8 | 17 - 141 |
| IS | 13C6-Lindane (gamma-BHC) | 76.5 | 5 - 124 |
| IS | 13C6-beta-BHC | 79.0 | 17 - 141 |
| IS | 13C6-delta-BHC | 78.5 | 16 - 150 |
| IS | 13C10-Heptachlor | 68.5 | 5 - 128 |
| IS | 13C12-Aldrin | 73.1 | 5 - 126 |
| IS | 13C10-Oxychlordane | 80.0 | 5 - 144 |
| IS | 13C10-cis-Heptachlor Epoxide | 85.0 | 8 - 146 |
| IS | 13C10-trans-Chlordane (gamma) | 80.0 | 15 - 144 |
| IS | 13C10-trans-Nonachlor | 78.5 | 13 - 149 |
| IS | 13C9-Endosulfan I (alpha) | 83.9 | 5 - 144 |
| IS | 13C12-2,4'-DDE | 95.9 | 26 - 169 |
| IS | 13C12-4,4'-DDE | 92.6 | 26 - 169 |
| IS | 13C12-Dieldrin | 87.1 | 19 - 161 |
| IS | 13C12-Endrin | 113 | 20 - 157 |
| IS | 13C10-cis-Nonachlor | 93.5 | 17 - 154 |
| IS | 13C9-Endosulfan II (beta) | 81.2 | 5 - 120 |
| IS | 13C12-2,4'-DDD | 85.8 | 14 - 200 |
| IS | 13C12-2,4'-DDT | 82.5 | 14 - 200 |
| IS | 13C12-4,4'-DDT | 95.4 | 13 - 200 |
| IS | 13C9-Endosulfan Sulfate | 95.6 | 5 - 144 |
| IS | 13C12-Methoxychlor | 107 | 8 - 200 |
| IS | 13C10-Mirex | 114 | 5 - 138 |
| IS | 13C12-Endrin Aldehyde | 40.7 | 5 - 144 |
| IS | 13C12-Endrin Ketone | 91.7 | 5 - 144 |

LCL-UCL - Lower control limit - upper control limit

| **Sample ID:** | **Method Blank** | | **EPA Method 1699** |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B8L0132 | Lab Sample: | B8L0132-BLK1 |
| Sample Size: | 1.00 L | Date Extracted: | 16-Dec-2018 8:31 | Date Analyzed: | 19-Dec-18 03:14 Column: ZB-50 |

| **Analyte** | **Conc. (pg/L)** | **DL** | **EMPC** | **Qualifiers** | | **Labeled Standard** | **%R** | **LCL-UCL** | **Qualifiers** |
|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | ND | 1.96 | | | IS | 13C12-4,4'-DDD | 64.3 | 5 - 120 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Vista Analytical Laboratory

**Sample ID: OPR** | **EPA Method 1699**

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B8L0132 | Lab Sample: | B8L0132-BS1 |
| Sample Size: | 1.00 L | Date Extracted: | 16-Dec-2018 8:31 | Date Analyzed: | 18-Dec-18 23:10 Column: ZB-50 |

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits | | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 997 | 1000 | 99.7 | 42 - 120 | IS | 13C12-4,4'-DDD | 80.1 | 14 - 200 |

LCL-UCL - Lower control limit - upper control limit

| **Sample ID: TS2-I-181205** | | **EPA Method 1699** |
|---|---|---|

| Client Data | | Sample Data | | Laboratory Data | | | |
|---|---|---|---|---|---|---|---|
| Name: | CDIM Engineering | Matrix: | Water | Lab Sample: | 1803930-01 | Date Received: | 06-Dec-2018 7:48 |
| Project: | LRTC 18-19 Industrial Stormwater 101-003 Ta | Sample Size: | 1.02 L | QC Batch: | B8L0069 | Date Extracted: | 10-Dec-2018 14:00 |
| Date Collected: | 05-Dec-2018 9:01 | | | Date Analyzed: | 13-Dec-18 06:05 Column: ZB-50 | | |
| | | | | | 19-Dec-18 22:11 Column: ZB-50 | | |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers | | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|
| Hexachlorobenzene | 510 | | | B | IS | 13C6-Hexachlorobenzene | 91.8 | 5 - 120 | |
| alpha-BHC | 82.5 | | | | IS | 13C6-alpha-BHC | 100 | 32 - 130 | |
| Lindane (gamma-BHC) | 62.1 | | | | IS | 13C6-Lindane (gamma-BHC) | 87.6 | 11 - 120 | |
| beta-BHC | 35.7 | | | J | IS | 13C6-beta-BHC | 71.2 | 32 - 130 | |
| delta-BHC | ND | 4.19 | | | IS | 13C6-delta-BHC | 67.1 | 36 - 137 | |
| Heptachlor | ND | 7.83 | | | IS | 13C10-Heptachlor | 79.6 | 5 - 120 | |
| Aldrin | ND | 8.36 | | | IS | 13C12-Aldrin | 43.2 | 5 - 120 | |
| Oxychlordane | ND | 26.5 | | | IS | 13C10-Oxychlordane | 53.9 | 23 - 135 | |
| cis-Heptachlor Epoxide | ND | | 63.9 | | IS | 13C10-cis-Heptachlor Epoxide | 56.4 | 27 - 137 | |
| trans-Heptachlor Epoxide | 257 | | | | IS | 13C10-trans-Chlordane (gamma) | 35.2 | 21 - 132 | |
| trans-Chlordane (gamma) | 269 | | | | IS | 13C10-trans-Nonachlor | 32.3 | 14 - 136 | |
| trans-Nonachlor | 140 | | | | IS | 13C9-Endosulfan I (alpha) | 35.2 | 15 - 148 | |
| cis-Chlordane (alpha) | 340 | | | | IS | 13C12-2,4'-DDE | 42.9 | 47 - 160 | H |
| Endosulfan I (alpha) | ND | 42.0 | | | IS | 13C12-4,4'-DDE | 31.1 | 47 - 160 | H |
| 2,4'-DDE | 173 | | | | IS | 13C12-Dieldrin | 28.6 | 40 - 151 | H |
| 4,4'-DDE | 3150 | | | | IS | 13C12-Endrin | 35.8 | 35 - 155 | |
| Dieldrin | 945 | | | | IS | 13C10-cis-Nonachlor | 20.9 | 36 - 139 | H |
| Endrin | 308 | | | | IS | 13C9-Endosulfan II (beta) | 26.4 | 5 - 122 | |
| cis-Nonachlor | ND | 63.1 | | | IS | 13C12-2,4'-DDD | 26.3 | 5 - 199 | |
| Endosulfan II (beta) | ND | 218 | | | IS | 13C12-2,4'-DDT | 15.8 | 5 - 199 | |
| 2,4'-DDD | 1090 | | | | IS | 13C12-4,4'-DDD | 30.3 | 5 - 120 | |
| 2,4'-DDT | 1310 | | | | IS | 13C12-4,4'-DDT | 11.0 | 5 - 120 | |
| 4,4'-DDD | 2070 | | | | IS | 13C9-Endosulfan Sulfate | 16.8 | 15 - 148 | |
| 4,4'-DDT | 4660 | | | | IS | 13C12-Methoxychlor | 14.5 | 5 - 120 | |
| Endosulfan Sulfate | ND | 219 | | | IS | 13C10-Mirex | 9.70 | 5 - 120 | |
| 4,4'-Methoxychlor | ND | 528 | | | IS | 13C12-Endrin Aldehyde | 14.6 | 15 - 148 | H |
| Mirex | ND | 94.6 | | | IS | 13C12-Endrin Ketone | 11.7 | 15 - 148 | H |
| Endrin Aldehyde | ND | 120 | | | | | | | |
| Endrin Ketone | ND | 429 | | | | | | | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

## Sample ID: TS2-I-181205 EPA Method 1699

| Client Data | | Sample Data | | Laboratory Data | | | |
|---|---|---|---|---|---|---|---|
| Name: | CDIM Engineering | Matrix: | Water | Lab Sample: | 1803930-01 | Date Received: | 06-Dec-2018 7:48 |
| Project: | LRTC 18-19 Industrial Stormwater 101-003 Ta | Sample Size: | 1.02 L | QC Batch: | B8L0069 | Date Extracted: | 10-Dec-2018 14:00 |
| Date Collected: | 05-Dec-2018 9:01 | | | Date Analyzed: | 13-Dec-18 06:05 Column: ZB-50 | | |
| | | | | | 19-Dec-18 22:11 Column: ZB-50 | | |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 510 | | | B |
| alpha-BHC | 82.5 | | | |
| Lindane (gamma-BHC) | 62.1 | | | |
| beta-BHC | 35.7 | | | J |
| delta-BHC | ND | 4.19 | | |
| Heptachlor | ND | 7.83 | | |
| Aldrin | ND | 8.36 | | |
| Oxychlordane | ND | 26.5 | | |
| cis-Heptachlor Epoxide | ND | | 63.9 | |
| trans-Heptachlor Epoxide | 257 | | | |
| trans-Chlordane (gamma) | 269 | | | |
| trans-Nonachlor | 140 | | | |
| cis-Chlordane (alpha) | 340 | | | |
| Endosulfan I (alpha) | ND | 42.0 | | |
| 2,4'-DDE | 173 | | | |
| 4,4'-DDE | 3150 | | | |
| Dieldrin | 945 | | | |
| Endrin | 308 | | | |
| cis-Nonachlor | ND | 63.1 | | |
| Endosulfan II (beta) | ND | 218 | | |
| 2,4'-DDD | 1090 | | | |
| 2,4'-DDT | 1310 | | | |
| 4,4'-DDD | 2070 | | | |
| 4,4'-DDT | 4660 | | | |
| Endosulfan Sulfate | ND | 219 | | |
| 4,4'-Methoxychlor | ND | 528 | | |
| Mirex | ND | 94.6 | | |
| Endrin Aldehyde | ND | 120 | | |
| Endrin Ketone | ND | 429 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 91.8 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 100 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 87.6 | 11 - 120 | |
| IS | 13C6-beta-BHC | 71.2 | 32 - 130 | |
| IS | 13C6-delta-BHC | 67.1 | 36 - 137 | |
| IS | 13C10-Heptachlor | 79.6 | 5 - 120 | |
| IS | 13C12-Aldrin | 43.2 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 53.9 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 56.4 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 35.2 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 32.3 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 35.2 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 42.9 | 47 - 160 | H |
| IS | 13C12-4,4'-DDE | 31.1 | 47 - 160 | H |
| IS | 13C12-Dieldrin | 28.6 | 40 - 151 | H |
| IS | 13C12-Endrin | 35.8 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 20.9 | 36 - 139 | H |
| IS | 13C9-Endosulfan II (beta) | 26.4 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 26.3 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 15.8 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 30.3 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 11.0 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 16.8 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 14.5 | 5 - 120 | |
| IS | 13C10-Mirex | 9.70 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 14.6 | 15 - 148 | H |
| IS | 13C12-Endrin Ketone | 11.7 | 15 - 148 | H |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

# DATA QUALIFIERS & ABBREVIATIONS

| | |
|---|---|
| **B** | **This compound was also detected in the method blank** |
| **Conc.** | **Concentration** |
| **D** | **Dilution** |
| **DL** | **Detection limit** |
| **E** | **The associated compound concentration exceeded the calibration range of the instrument** |
| **H** | **Recovery and/or RPD was outside laboratory acceptance limits** |
| **I** | **Chemical Interference** |
| **J** | **The amount detected is below the Reporting Limit/LOQ** |
| **LOD** | **Limits of Detection** |
| **LOQ** | **Limits of Quantitation** |
| **M** | **Estimated Maximum Possible Concentration (CA Region 2 projects only)** |
| **NA** | **Not applicable** |
| **ND** | **Not Detected** |
| **Q** | **Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)** |
| **TEQ** | **Toxic Equivalency** |
| **U** | **Not Detected (specific projects only)** |
| ***** | **See Cover Letter** |

**Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.**

## Vista Analytical Laboratory Certifications

| Accrediting Authority | Certificate Number |
|---|---|
| Alaska Department of Environmental Conservation | 17-013 |
| Arkansas Department of Environmental Quality | 18-008-0 |
| California Department of Health – ELAP | 2892 |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005 | 3091.01 |
| Florida Department of Health | E87777 |
| Hawaii Department of Health | N/A |
| Louisiana Department of Environmental Quality | 01977 |
| Maine Department of Health | 2018017 |
| Michigan Department of Environmental Quality | 9932 |
| Minnesota Department of Health | 1322288 |
| New Hampshire Environmental Accreditation Program | 207718 |
| New Jersey Department of Environmental Protection | CA003 |
| New York Department of Health | 11411 |
| Oregon Laboratory Accreditation Program | 4042-009 |
| Pennsylvania Department of Environmental Protection | 015 |
| Texas Commission on Environmental Quality | T104704189-18-9 |
| Virginia Department of General Services | 9618 |
| Washington Department of Ecology | C584-18 |
| Wisconsin Department of Natural Resources | 998036160 |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

| MATRIX: Air | |
|---|---|
| **Description of Test** | **Method** |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23 |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water | |
|---|---|
| **Description of Test** | **Method** |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS | EPA 522 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Dioxin by GC/HRMS | EPA 613 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids | |
|---|---|
| **Description of Test** | **Method** |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613 |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

1803930 1.2°C

**LABORATORY:**
Vista Analytical
1104 Windfield Way, El Dorado Hills CA 95762
(916) 673-1520
Karen Volpendesta

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaroud Time X Standard ☐ Other ______
GeoTracker EDF required? ☐ Yes X No
LOCUS EDD required? ☐ Yes X No
Report Results to: ☐ RL X MDL
Report soil results to: ☐ wet weight (total) ☐ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**COC Number:**

Page 1 of 1

**SDG number:**

**PROJECT INFORMATION**

**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

ANALYSIS REQUESTED

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | Pesticides (EPA 1699) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|
| | TS2-I-181205 | 12/5/18 | 901 | W | 3 | X | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| **Field Filtered (X):** | | | | | | | |
| **Preservation Used:** 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other ______ | | | | | | 1 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks | CDIM | 12/5/18 1200 | Brett Bennett | VAL | 12/6/18 0748 |
| | | | | | |
| | | | | | |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 908 256 9230 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 12/5/18 1200 |

Vista Analytical Laboratory

# Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1803930 TAT Std

| | | | |
|---|---|---|---|
| **Samples Arrival:** | **Date/Time** 12/6/18 0748 | **Initials:** BSB | **Location:** WR-2 **Shelf/Rack:** NA |
| **Logged In:** | **Date/Time** 12/06/18 1414 | **Initials:** WWS | **Location:** WR-2 **Shelf/Rack:** 2-2, D-6 |

| **Delivered By:** | FedEx | UPS | On Trac | GSO | DHL | Hand Delivered | Other |
|---|---|---|---|---|---|---|---|
| **Preservation:** | Ice | | Blue Ice | | Dry Ice | | None |

| | | |
|---|---|---|
| **Temp °C:** 1.3 **(uncorrected)** | **Probe used: Y / N** | **Thermometer ID:** IR-4 |
| **Temp °C:** 1.2 **(corrected)** | | |

| | | YES | NO | NA |
|---|---|---|---|---|
| Adequate Sample Volume Received? | | ✓ | | |
| Holding Time Acceptable? | | ✓ | | |
| Shipping Container(s) Intact? | | ✓ | | |
| Shipping Custody Seals Intact? | | | | ✓ |
| Shipping Documentation Present? | | ✓ | | |
| Airbill | Trk # 7842 1591 3965 | ✓ | | |
| Sample Container Intact? | | ✓ | | |
| Sample Custody Seals Intact? | | | | ✓ |
| Chain of Custody / Sample Documentation Present? | | ✓ | | |
| COC Anomaly/Sample Acceptance Form completed? | | ✓* | | |

| | | | | |
|---|---|---|---|---|
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? | | | | ✓ |
| Preservation Documented: | $Na_2S_2O_3$ Trizma None Other | Yes | No | NA |

| Shipping Container | Vista | Client | Retain | Return | Dispose |
|---|---|---|---|---|---|

*Comments:* * sample labels on bottles received very hard to read. "2I" written on caps.

# Chain of Custody Anomaly/Sample Acceptance Form

Vista
Analytical Laboratory

| | | | |
|---|---|---|---|
| Client: | CDIM Engineering | Workorder Number: | 1803930 |
| Contact: | Scott Bourne | Date Received: | 06-Dec-18 07:48 |
| Email: | sab@cdimengineering.com | Documented by/date: | MSparks/12-06-18 |
| Phone: | (415) 498-0535 | | |

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

**The following information or item is needed to proceed with analysis:**

- [ ] Complete Chain-of-Custody
- [ ] Test Method Requested
- [ ] Analyte List Requested
- [ ] Other:
- [ ] Preservative
- [x] Sample Identification: **see comments**
- [ ] Sample Collection Date and/or Time
- [ ] Collector's Name
- [ ] Sample Type
- [ ] Sample Location

**The following anomalies were noted. Authorization is needed to proceed with analysis.**

- [ ] Temperature outside < 6°C Range — Samples Affected: ____

Temperature ______°C — Ice Present? Yes No Melted

- [ ] Sample ID Discrepancy
- [ ] Sample Holding Time Missed
- [ ] Custody Seals Broken
- [ ] Insufficient Sample Size
- [ ] Sample Container(s) Broken
- [ ] Incorrect Container Type

**Comments:**

Sample labels are illegible on bottles.

**Client Authorization**

Proceed with Analysis: YES NO — Signature and Date [signature] 12/11/18

Client Comments/Instructions Client notified via email 12/11/18.

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

January 28, 2019

## CDIM Engineering - San Francisco, CA

| | |
|---|---|
| Sample Delivery Group: | L1060709 |
| Samples Received: | 01/14/2019 |
| Project Number: | 101-003, TASK 1 |
| Description: | LRTC 2018-2019 Industrial Stormwater |
| Site: | 402 WRIGHT AVE, RICHMOND, CA |
| Report To: | Mary Cunningham<br>45 Polk Street<br>3rd Floor<br>San Francisco, CA 94102 |

Entire Report Reviewed By:

Jared Starkey
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

# TABLE OF CONTENTS

Cp Tc Ss Cn Sr Qc Gl Al Sc

## TS1-E-190111 L1060709-01 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/11/19 15:55 | 01/14/19 09:30 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1223836 | 1 | 01/16/19 09:49 | 01/16/19 10:23 | MMF |
| Wet Chemistry by Method 1664A | WG1225533 | 1 | 01/18/19 09:31 | 01/18/19 15:34 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1222907 | 1 | 01/15/19 09:00 | 01/15/19 09:00 | SJM |
| Metals (ICPMS) by Method 200.8 | WG1223329 | 1 | 01/15/19 09:50 | 01/16/19 14:47 | LD |

## TS2-E-190111 L1060709-02 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/11/19 16:15 | 01/14/19 09:30 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1224079 | 1 | 01/16/19 19:59 | 01/16/19 21:30 | MMF |
| Wet Chemistry by Method 1664A | WG1225533 | 1 | 01/18/19 09:31 | 01/18/19 15:34 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1222907 | 1 | 01/15/19 09:00 | 01/15/19 09:00 | SJM |
| Metals (ICPMS) by Method 200.8 | WG1223329 | 1 | 01/15/19 09:50 | 01/16/19 14:51 | LD |

## TS3-E-190111 L1060709-03 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/11/19 16:30 | 01/14/19 09:30 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1224079 | 1 | 01/16/19 19:59 | 01/16/19 21:30 | MMF |
| Wet Chemistry by Method 1664A | WG1225533 | 1 | 01/18/19 09:31 | 01/18/19 15:34 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1222907 | 1 | 01/15/19 09:00 | 01/15/19 09:00 | SJM |
| Metals (ICPMS) by Method 200.8 | WG1223329 | 1 | 01/15/19 09:50 | 01/16/19 14:56 | LD |

## TS4-E-190111 L1060709-04 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/11/19 16:45 | 01/14/19 09:30 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1224079 | 1 | 01/16/19 19:59 | 01/16/19 21:30 | MMF |
| Wet Chemistry by Method 1664A | WG1225533 | 1 | 01/18/19 09:31 | 01/18/19 15:34 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1222907 | 1 | 01/15/19 09:00 | 01/15/19 09:00 | SJM |
| Metals (ICPMS) by Method 200.8 | WG1223329 | 1 | 01/15/19 09:50 | 01/16/19 15:01 | LD |

## TSX-E-190111 L1060709-05 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/11/19 16:30 | 01/14/19 09:30 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1224079 | 1 | 01/16/19 19:59 | 01/16/19 21:30 | MMF |
| Wet Chemistry by Method 1664A | WG1229105 | 1 | 01/27/19 08:44 | 01/27/19 18:39 | JDD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1222907 | 1 | 01/15/19 09:00 | 01/15/19 09:00 | SJM |
| Metals (ICPMS) by Method 200.8 | WG1223329 | 1 | 01/15/19 09:50 | 01/16/19 13:52 | LD |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jared Starkey
Project Manager

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 | 1 | 01/16/2019 10:23 | WG1223836 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 763 | 5260 | 1 | 01/18/2019 15:34 | WG1225533 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.63 | T8 | 1 | 01/15/2019 09:00 | WG1222907 |

**Sample Narrative:**

L1060709-01 WG1222907: 7.63 at 18.1C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 31.7 | J | 20.0 | 100 | 1 | 01/16/2019 14:47 | WG1223329 |
| Iron | U | | 15.0 | 100 | 1 | 01/16/2019 14:47 | WG1223329 |
| Lead | 0.821 | J | 0.260 | 1.00 | 1 | 01/16/2019 14:47 | WG1223329 |
| Zinc | 95.7 | | 1.91 | 10.0 | 1 | 01/16/2019 14:47 | WG1223329 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 4800 | | 357 | 2550 | 1 | 01/16/2019 21:30 | WG1224079 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 824 | 5680 | 1 | 01/18/2019 15:34 | WG1225533 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.95 | T8 | 1 | 01/15/2019 09:00 | WG1222907 |

**Sample Narrative:**

L1060709-02 WG1222907: 7.95 at 18.5C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 95.7 | J | 20.0 | 100 | 1 | 01/16/2019 14:51 | WG1223329 |
| Iron | 169 | | 15.0 | 100 | 1 | 01/16/2019 14:51 | WG1223329 |
| Lead | 2.17 | | 0.260 | 1.00 | 1 | 01/16/2019 14:51 | WG1223329 |
| Zinc | 36.9 | | 1.91 | 10.0 | 1 | 01/16/2019 14:51 | WG1223329 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 | 1 | 01/16/2019 21:30 | WG1224079 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 763 | 5260 | 1 | 01/18/2019 15:34 | WG1225533 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.33 | T8 | 1 | 01/15/2019 09:00 | WG1222907 |

**Sample Narrative:**

L1060709-03 WG1222907: 7.33 at 18C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 31.5 | J | 20.0 | 100 | 1 | 01/16/2019 14:56 | WG1223329 |
| Iron | U | | 15.0 | 100 | 1 | 01/16/2019 14:56 | WG1223329 |
| Lead | 1.26 | | 0.260 | 1.00 | 1 | 01/16/2019 14:56 | WG1223329 |
| Zinc | 47.1 | | 1.91 | 10.0 | 1 | 01/16/2019 14:56 | WG1223329 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 500 | J | 350 | 2500 | 1 | 01/16/2019 21:30 | WG1224079 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 797 | 5490 | 1 | 01/18/2019 15:34 | WG1225533 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.40 | T8 | 1 | 01/15/2019 09:00 | WG1222907 |

**Sample Narrative:**

L1060709-04 WG1222907: 7.4 at 18.1C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 37.9 | J | 20.0 | 100 | 1 | 01/16/2019 15:01 | WG1223329 |
| Iron | 131 | | 15.0 | 100 | 1 | 01/16/2019 15:01 | WG1223329 |
| Lead | 0.889 | J | 0.260 | 1.00 | 1 | 01/16/2019 15:01 | WG1223329 |
| Zinc | 51.5 | | 1.91 | 10.0 | 1 | 01/16/2019 15:01 | WG1223329 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 | 1 | 01/16/2019 21:30 | WG1224079 |

**Sample Narrative:**

L1060709-05 WG1224079: Not enough sample volume for lab duplicate analysis.

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 755 | 5210 | 1 | 01/27/2019 18:39 | WG1229105 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.20 | T8 | 1 | 01/15/2019 09:00 | WG1222907 |

**Sample Narrative:**

L1060709-05 WG1222907: 7.2 at 18.4C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 31.1 | J | 20.0 | 100 | 1 | 01/16/2019 13:52 | WG1223329 |
| Iron | U | | 15.0 | 100 | 1 | 01/16/2019 13:52 | WG1223329 |
| Lead | 1.16 | | 0.260 | 1.00 | 1 | 01/16/2019 13:52 | WG1223329 |
| Zinc | 47.8 | | 1.91 | 10.0 | 1 | 01/16/2019 13:52 | WG1223329 |

## Method Blank (MB)

(MB) R3376636-1 01/16/19 10:23

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 |

## L1061072-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1061072-01 01/16/19 10:23 • (DUP) R3376636-3 01/16/19 10:23

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 6550000 | 5940000 | 1 | 9.77 | J3 | 5 |

## Laboratory Control Sample (LCS)

(LCS) R3376636-2 01/16/19 10:23

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Suspended Solids | 773000 | 892000 | 115 | 85.0-115 | |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3376656-1 01/16/19 21:30

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 |

## L1060710-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1060710-01 01/16/19 21:30 • (DUP) R3376656-3 01/16/19 21:30

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 424000 | 412000 | 1 | 2.87 | | 5 |

## L1060710-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1060710-02 01/16/19 21:30 • (DUP) R3376656-4 01/16/19 21:30

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 77000 | 79000 | 1 | 2.56 | | 5 |

## Laboratory Control Sample (LCS)

(LCS) R3376656-2 01/16/19 21:30

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Suspended Solids | 773000 | 772000 | 99.9 | 85.0-115 | |

## Method Blank (MB)

(MB) R3377010-1 01/18/19 15:34

| Analyte | MB Result | MB Qualifier | MB MDL | MB RDL |
|---|---|---|---|---|
| | ug/l | | ug/l | ug/l |
| TPH - Oil & Grease | U | | 725 | 5000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3377010-2 01/18/19 15:34 • (LCSD) R3377010-3 01/18/19 15:34

| Analyte | Spike Amount | LCS Result | LCSD Result | LCS Rec. | LCSD Rec. | Rec. Limits | LCS Qualifier | LCSD Qualifier | RPD | RPD Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| | ug/l | ug/l | ug/l | % | % | % | | | % | % |
| TPH - Oil & Grease | 20000 | 14700 | 16200 | 73.5 | 81.0 | 64.0-132 | | | 9.71 | 18 |

## Method Blank (MB)

(MB) R3378978-1 01/27/19 18:39

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| TPH - Oil & Grease | U | | 725 | 5000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3378978-2 01/27/19 18:39 • (LCSD) R3378978-3 01/27/19 18:39

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 20000 | 18200 | 18500 | 91.0 | 92.5 | 64.0-132 | | | 1.63 | 34 |

## L1060709-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060709-05 01/27/19 18:39 • (MS) R3378978-4 01/27/19 18:39 • (MSD) R3378978-5 01/27/19 18:39

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 20000 | U | 17200 | 17700 | 85.8 | 88.3 | 1 | 64.0-132 | | | 2.87 | 34 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## L1060154-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1060154-07 01/15/19 09:00 • (DUP) R3375826-2 01/15/19 09:00

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 5.18 | 5.18 | 1 | 0.000 | | 1 |

Sample Narrative:
OS: 5.18 at 18.2C
DUP: 5.18 at 18.2C

## L1060709-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1060709-05 01/15/19 09:00 • (DUP) R3375826-3 01/15/19 09:00

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 7.20 | 7.19 | 1 | 0.139 | | 1 |

Sample Narrative:
OS: 7.2 at 18.4C
DUP: 7.19 at 18C

## Laboratory Control Sample (LCS)

(LCS) R3375826-1 01/15/19 09:00

| Analyte | Spike Amount su | LCS Result su | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| pH | 10.0 | 9.98 | 99.8 | 99.0-101 | |

Sample Narrative:
LCS: 9.98 at 17.2C

## Method Blank (MB)

(MB) R3376196-1 01/16/19 11:11

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 |
| Iron | U | | 15.0 | 100 |
| Lead | U | | 0.260 | 1.00 |
| Zinc | U | | 1.91 | 10.0 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3376196-2 01/16/19 11:16 • (LCSD) R3376196-3 01/16/19 11:21

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 4840 | 5000 | 96.8 | 99.9 | 85.0-115 | | | 3.20 | 20 |
| Iron | 5000 | 4820 | 4970 | 96.5 | 99.4 | 85.0-115 | | | 2.99 | 20 |
| Lead | 50.0 | 48.3 | 50.0 | 96.7 | 99.9 | 85.0-115 | | | 3.32 | 20 |
| Zinc | 50.0 | 50.0 | 50.4 | 100 | 101 | 85.0-115 | | | 0.730 | 20 |

## L1060594-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060594-03 01/16/19 11:25 • (MS) R3376196-5 01/16/19 11:34 • (MSD) R3376196-6 01/16/19 11:39

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 63.0 | 4970 | 4830 | 98.1 | 95.4 | 1 | 70.0-130 | | | 2.69 | 20 |
| Iron | 5000 | 37.1 | 4980 | 4790 | 98.9 | 95.1 | 1 | 70.0-130 | | | 3.93 | 20 |
| Lead | 50.0 | 1.02 | 50.4 | 49.5 | 98.8 | 96.9 | 1 | 70.0-130 | | | 1.95 | 20 |
| Zinc | 50.0 | 5.65 | 53.8 | 54.0 | 96.2 | 96.6 | 1 | 70.0-130 | | | 0.339 | 20 |

Sample Narrative:

OS: Potentially Dissolved

## L1060709-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060709-05 01/16/19 13:52 • (MS) R3376196-7 01/16/19 13:57 • (MSD) R3376196-8 01/16/19 14:01

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 31.1 | 4870 | 4920 | 96.7 | 97.7 | 1 | 70.0-130 | | | 1.01 | 20 |
| Iron | 5000 | U | 4950 | 4950 | 99.0 | 99.0 | 1 | 70.0-130 | | | 0.0428 | 20 |
| Lead | 50.0 | 1.16 | 49.7 | 50.8 | 97.1 | 99.3 | 1 | 70.0-130 | | | 2.16 | 20 |
| Zinc | 50.0 | 47.8 | 98.3 | 98.0 | 101 | 101 | 1 | 70.0-130 | | | 0.268 | 20 |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J3 | The associated batch QC was outside the established quality control range for precision. |
| T8 | Sample(s) received past/too close to holding time expiration. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO00356 |
| Kentucky [1,6] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1,4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

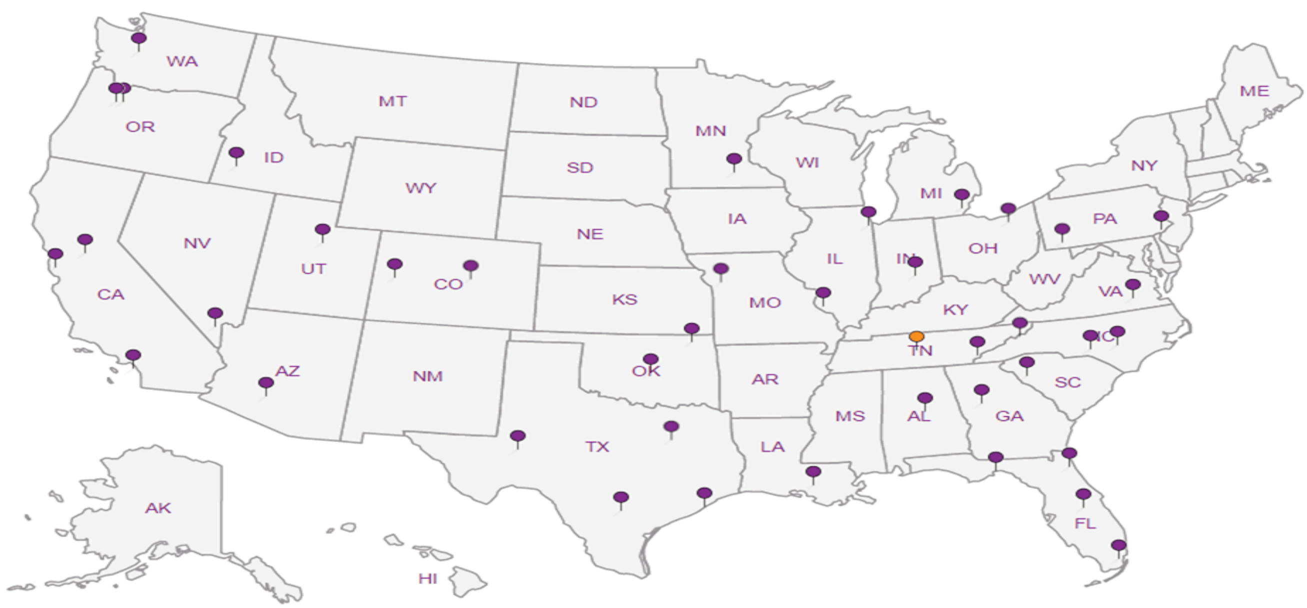
## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

C006

**LABORATORY:**
ESC Laboratory
12065 Lebanon Road, Mt. Juliet, TN 37122
(615) 773-9772
Brian Ford

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaround Time X Standard □ Other
GeoTracker EDF required? □ Yes X No
LOCUS EDD required? □ Yes X No
Report Results to: □ RL X MDL
Report soil results to: □ wet weight (total) □ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**COC Number:**

Page 1 of 1

**SDG number:** L1060709

**PROJECT INFORMATION**
**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

**ANALYSIS REQUESTED**

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | pH (SM 4500HB) | Total Suspended Solids (SM 2540D) | Oil & Grease (EPA 1664A SGT-HEM) | Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|---|---|---|
| | TS1-E-190111 | 1/11/2019 | 1555 | W | 5 | X | X | X | X | -01 |
| | TS2-E-190111 | 1/11/2019 | 1615 | W | 5 | X | X | X | X | -02 |
| | TS3-E-190111 | 1/11/2019 | 1630 | W | 5 | X | X | X | X | -03 |
| | TS4-E-190111 | 1/11/2019 | 1645 | W | 5 | X | X | X | X | -04 |
| | TSX-E-190111 | 1/11/2019 | 1630 | W | 9 | X | X | X | X | Perform MS/MSD using additional volume provided -05 |
| | | | | | Field Filtered (X): | | | | | |
| | Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | 1 | 1 | 1, 3 | 1, 4 | |

Handwritten above metals column: √2; additional column preservation: 1, 4

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

Cooler (1of3) 4624 2994 7701/7723/7712 1 1.4°c 3.0 TOA3 2 1.0°c/1.6°c 3

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks | CDIM | 1/11/19 2020 | | | |
| | | | | | |
| | | | [signature] | | 1-14-19 0930 |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

SAMPLERS NAME: Bryan Starks
SAMPLERS SIGNATURE: [signature]
MOBILE #: 808 256 9250
DATE / TIME: 1/11/19 2020

count: ~~29~~ 24
OK TO

# Pace Analytical National Center for Testing & Innovation
## Cooler Receipt Form

| | | | |
|---|---|---|---|
| Client: CDIE~~AG~~GSFCA | | SDG# | L1060709 |
| Cooler Received/Opened On: 1/14 /19 | | Temperature: | 1.4°c/1.0°c/1.6°c |
| Received By: Troy Dunlap | | | |
| Signature: [signature] | | | |

| Receipt Check List | NP | Yes | No |
|---|---|---|---|
| COC Seal Present / Intact? | ✓ | | |
| COC Signed / Accurate? | | ✓ | |
| Bottles arrive intact? | | ✓ | |
| Correct bottles used? | | ✓ | |
| Sufficient volume sent? | | ✓ | |
| If Applicable | | | |
| VOA Zero headspace? | | | |
| Preservation Correct / Checked? | | ✓ | |

# ANALYTICAL REPORT

January 18, 2019

## CDIM Engineering - San Francisco, CA

| | |
|---|---|
| Sample Delivery Group: | L1060710 |
| Samples Received: | 01/14/2019 |
| Project Number: | 101-003, TASK 1 |
| Description: | LRTC 2018-2019 Industrial Stormwater |
| Site: | 402 WRIGHT AVE, RICHMOND, CA |
| Report To: | Mary Cunningham<br>45 Polk Street<br>3rd Floor<br>San Francisco, CA 94102 |

Entire Report Reviewed By:

Brian Ford
Project Manager



# TABLE OF CONTENTS

## TS1-I-190111 L1060710-01 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/11/19 15:50 | 01/14/19 09:30 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1224079 | 1 | 01/16/19 19:59 | 01/16/19 21:30 | MMF |
| Wet Chemistry by Method 1664A | WG1225533 | 1 | 01/18/19 09:31 | 01/18/19 15:34 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1224021 | 1 | 01/16/19 08:45 | 01/16/19 08:45 | SJM |
| Metals (ICPMS) by Method 200.8 | WG1223329 | 1 | 01/15/19 09:50 | 01/16/19 15:05 | LD |

## TS2-I-190111 L1060710-02 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/11/19 16:05 | 01/14/19 09:30 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1224079 | 1 | 01/16/19 19:59 | 01/16/19 21:30 | MMF |
| Wet Chemistry by Method 1664A | WG1225533 | 1 | 01/18/19 09:31 | 01/18/19 15:34 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1224021 | 1 | 01/16/19 08:45 | 01/16/19 08:45 | SJM |
| Metals (ICPMS) by Method 200.8 | WG1223329 | 1 | 01/15/19 09:50 | 01/16/19 15:10 | LD |

## TS3-I-190111 L1060710-03 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/11/19 16:25 | 01/14/19 09:30 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1224079 | 1 | 01/16/19 19:59 | 01/16/19 21:30 | MMF |
| Wet Chemistry by Method 1664A | WG1225533 | 1 | 01/18/19 09:31 | 01/18/19 15:34 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1224021 | 1 | 01/16/19 08:45 | 01/16/19 08:45 | SJM |
| Metals (ICPMS) by Method 200.8 | WG1223329 | 1 | 01/15/19 09:50 | 01/16/19 15:14 | LD |

## TS4-I-190111 L1060710-04 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/11/19 16:40 | 01/14/19 09:30 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1224079 | 1 | 01/16/19 19:59 | 01/16/19 21:30 | MMF |
| Wet Chemistry by Method 1664A | WG1225533 | 1 | 01/18/19 09:31 | 01/18/19 15:34 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1224021 | 1 | 01/16/19 08:45 | 01/16/19 08:45 | SJM |
| Metals (ICPMS) by Method 200.8 | WG1223329 | 10 | 01/15/19 09:50 | 01/16/19 15:19 | LD |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Project Manager

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 424000 | | 14000 | 100000 | 1 | 01/16/2019 21:30 | WG1224079 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 788 | 5440 | 1 | 01/18/2019 15:34 | WG1225533 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 8.01 | T8 | 1 | 01/16/2019 08:45 | WG1224021 |

**Sample Narrative:**

L1060710-01 WG1224021: 8.01 at 17.2C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 2660 | | 20.0 | 100 | 1 | 01/16/2019 15:05 | WG1223329 |
| Iron | 6480 | | 15.0 | 100 | 1 | 01/16/2019 15:05 | WG1223329 |
| Lead | 130 | | 0.260 | 1.00 | 1 | 01/16/2019 15:05 | WG1223329 |
| Zinc | 591 | | 1.91 | 10.0 | 1 | 01/16/2019 15:05 | WG1223329 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 77000 | | 1750 | 12500 | 1 | 01/16/2019 21:30 | WG1224079 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 771 | 5320 | 1 | 01/18/2019 15:34 | WG1225533 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.69 | T8 | 1 | 01/16/2019 08:45 | WG1224021 |

Sample Narrative:

L1060710-02 WG1224021: 7.69 at 18.3C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 904 | | 20.0 | 100 | 1 | 01/16/2019 15:10 | WG1223329 |
| Iron | 1990 | | 15.0 | 100 | 1 | 01/16/2019 15:10 | WG1223329 |
| Lead | 21.3 | | 0.260 | 1.00 | 1 | 01/16/2019 15:10 | WG1223329 |
| Zinc | 110 | | 1.91 | 10.0 | 1 | 01/16/2019 15:10 | WG1223329 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 21900 | | 354 | 2530 | 1 | 01/16/2019 21:30 | WG1224079 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 763 | 5260 | 1 | 01/18/2019 15:34 | WG1225533 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.44 | T8 | 1 | 01/16/2019 08:45 | WG1224021 |

**Sample Narrative:**

L1060710-03 WG1224021: 7.44 at 18.1C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 565 | | 20.0 | 100 | 1 | 01/16/2019 15:14 | WG1223329 |
| Iron | 1120 | | 15.0 | 100 | 1 | 01/16/2019 15:14 | WG1223329 |
| Lead | 54.2 | | 0.260 | 1.00 | 1 | 01/16/2019 15:14 | WG1223329 |
| Zinc | 88.8 | | 1.91 | 10.0 | 1 | 01/16/2019 15:14 | WG1223329 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 8800 | | 350 | 2500 | 1 | 01/16/2019 21:30 | WG1224079 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 5850 | | 771 | 5320 | 1 | 01/18/2019 15:34 | WG1225533 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.43 | T8 | 1 | 01/16/2019 08:45 | WG1224021 |

**Sample Narrative:**

L1060710-04 WG1224021: 7.43 at 18.1C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 209 | J | 200 | 1000 | 10 | 01/16/2019 15:19 | WG1223329 |
| Iron | 448 | J | 150 | 1000 | 10 | 01/16/2019 15:19 | WG1223329 |
| Lead | 8.59 | J | 2.60 | 10.0 | 10 | 01/16/2019 15:19 | WG1223329 |
| Zinc | 101 | | 19.1 | 100 | 10 | 01/16/2019 15:19 | WG1223329 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3376656-1 01/16/19 21:30

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 |

## L1060710-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1060710-01 01/16/19 21:30 • (DUP) R3376656-3 01/16/19 21:30

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 424000 | 412000 | 1 | 2.87 | | 5 |

## L1060710-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1060710-02 01/16/19 21:30 • (DUP) R3376656-4 01/16/19 21:30

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 77000 | 79000 | 1 | 2.56 | | 5 |

## Laboratory Control Sample (LCS)

(LCS) R3376656-2 01/16/19 21:30

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Suspended Solids | 773000 | 772000 | 99.9 | 85.0-115 | |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3377010-1 01/18/19 15:34

| Analyte | MB Result | MB Qualifier | MB MDL | MB RDL |
|---|---|---|---|---|
| | ug/l | | ug/l | ug/l |
| TPH - Oil & Grease | U | | 725 | 5000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3377010-2 01/18/19 15:34 • (LCSD) R3377010-3 01/18/19 15:34

| Analyte | Spike Amount | LCS Result | LCSD Result | LCS Rec. | LCSD Rec. | Rec. Limits | LCS Qualifier | LCSD Qualifier | RPD | RPD Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| | ug/l | ug/l | ug/l | % | % | % | | | % | % |
| TPH - Oil & Grease | 20000 | 14700 | 16200 | 73.5 | 81.0 | 64.0-132 | | | 9.71 | 18 |

## L1059717-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1059717-01 01/16/19 08:45 • (DUP) R3376139-2 01/16/19 08:45

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 9.51 | 9.50 | 1 | 0.105 | | 1 |

Sample Narrative:

OS: 9.51 at 13.8C

DUP: 9.5 at 13.7C

## L1061076-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1061076-01 01/16/19 08:45 • (DUP) R3376139-3 01/16/19 08:45

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 7.36 | 7.38 | 1 | 0.271 | | 1 |

Sample Narrative:

OS: 7.36 at 18C

DUP: 7.38 at 18.2C

## Laboratory Control Sample (LCS)

(LCS) R3376139-1 01/16/19 08:45

| Analyte | Spike Amount su | LCS Result su | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| pH | 10.0 | 10.0 | 100 | 99.0-101 | |

Sample Narrative:

LCS: 10 at 17.7C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3376196-1 01/16/19 11:11

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 |
| Iron | U | | 15.0 | 100 |
| Lead | U | | 0.260 | 1.00 |
| Zinc | U | | 1.91 | 10.0 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3376196-2 01/16/19 11:16 • (LCSD) R3376196-3 01/16/19 11:21

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 4840 | 5000 | 96.8 | 99.9 | 85.0-115 | | | 3.20 | 20 |
| Iron | 5000 | 4820 | 4970 | 96.5 | 99.4 | 85.0-115 | | | 2.99 | 20 |
| Lead | 50.0 | 48.3 | 50.0 | 96.7 | 99.9 | 85.0-115 | | | 3.32 | 20 |
| Zinc | 50.0 | 50.0 | 50.4 | 100 | 101 | 85.0-115 | | | 0.730 | 20 |

## L1060594-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060594-03 01/16/19 11:25 • (MS) R3376196-5 01/16/19 11:34 • (MSD) R3376196-6 01/16/19 11:39

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 63.0 | 4970 | 4830 | 98.1 | 95.4 | 1 | 70.0-130 | | | 2.69 | 20 |
| Iron | 5000 | 37.1 | 4980 | 4790 | 98.9 | 95.1 | 1 | 70.0-130 | | | 3.93 | 20 |
| Lead | 50.0 | 1.02 | 50.4 | 49.5 | 98.8 | 96.9 | 1 | 70.0-130 | | | 1.95 | 20 |
| Zinc | 50.0 | 5.65 | 53.8 | 54.0 | 96.2 | 96.6 | 1 | 70.0-130 | | | 0.339 | 20 |

## L1060709-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060709-05 01/16/19 13:52 • (MS) R3376196-7 01/16/19 13:57 • (MSD) R3376196-8 01/16/19 14:01

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 31.1 | 4870 | 4920 | 96.7 | 97.7 | 1 | 70.0-130 | | | 1.01 | 20 |
| Iron | 5000 | U | 4950 | 4950 | 99.0 | 99.0 | 1 | 70.0-130 | | | 0.0428 | 20 |
| Lead | 50.0 | 1.16 | 49.7 | 50.8 | 97.1 | 99.3 | 1 | 70.0-130 | | | 2.16 | 20 |
| Zinc | 50.0 | 47.8 | 98.3 | 98.0 | 101 | 101 | 1 | 70.0-130 | | | 0.268 | 20 |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| T8 | Sample(s) received past/too close to holding time expiration. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO00356 |
| Kentucky [1 6] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

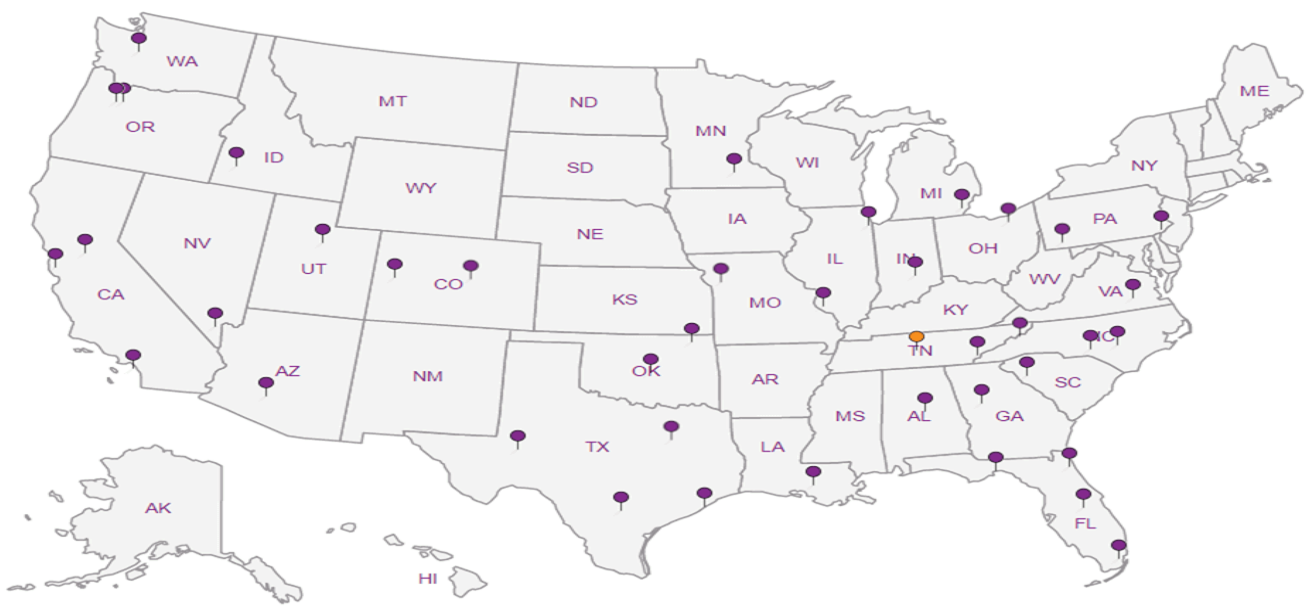
## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

C007

**LABORATORY:**
ESC Laboratory
12065 Lebanon Road, Mt. Juliet, TN 37122
(615) 773-9772
Brian Ford

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaroud Time X Standard □ Other
GeoTracker EDF required? □ Yes X No
LOCUS EDD required? □ Yes X No
Report Results to: □ RL X MDL
Report soil results to: □ wet weight (total) □ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**PROJECT INFORMATION**
**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

COC Number:
Page 1 of 1
SDG number: L1060710

**ANALYSIS REQUESTED**

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | pH (SM 4500HB) | Total Suspended Solids (SM 2540D) | Oil & Grease (EPA 1664A SGT-HEM) | Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS) | | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TS1-I-190111 | 1/11/2019 | 1550 | W | 5 | X | X | X | X | | -01 |
| | TS2-I-190111 | 1/11/2019 | 1605 | W | 5 | X | X | X | X | | -02 |
| | TS3-I-190111 | 1/11/2019 | 1625 | W | 5 | X | X | X | X | | -03 |
| | TS4-I-190111 | 1/11/2019 | 1640 | W | 5 | X | X | X | X | | -04 |
| | Field Filtered (X): | | | | | | | | | | |
| | Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | 1 | 1 | 1, 3 | 1, 4 | 1, 4 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

Cooler (1 of 3) 4624 2994 7701/7723/7712 1 1.4° ±0 TDA3 2 1.0°/1.6° 3

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Bryan Starks | CDIM | 1/11/19 820pm | | | |
| | | | | | |
| | | | | | 1-14-19 0930 |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 808 256 9230 |
| SAMPLERS SIGNATURE | | DATE / TIME | 1/11/19 2020 |

count: 20

# Pace Analytical National Center for Testing & Innovation
## Cooler Receipt Form

| | | | |
|---|---|---|---|
| Client: CDIENGSFCA | | SDG# | L1060710 |
| Cooler Received/Opened On: 1/14/19 | | Temperature: | 1.4°C / 1.0°C / 1.6°C |
| Received By: Troy Dunlap | | | |
| Signature: | | | |

| Receipt Check List | NP | Yes | No |
|---|---|---|---|
| COC Seal Present / Intact? | ✓ | | |
| COC Signed / Accurate? | | ✓ | |
| Bottles arrive intact? | | ✓ | |
| Correct bottles used? | | ✓ | |
| Sufficient volume sent? | | ✓ | |
| If Applicable | | | |
| VOA Zero headspace? | | | |
| Preservation Correct / Checked? | | ✓ | |

January 29, 2019

**Vista Work Order No. 1900110**

Mr. Scott Bourne
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, CA 94102

Dear Mr. Bourne,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on January 14, 2019 under your Project Name '101-003, Task 1'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.*

**Vista Work Order No. 1900110**
**Case Narrative**

**Sample Condition on Receipt:**

One water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

**Analytical Notes:**

**<u>EPA Method 1699</u>**

The sample was extracted and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

<u>Holding Times</u>

The sample was extracted and analyzed within the method hold times.

<u>Quality Control</u>

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

Labeled standard recoveries for all QC and field samples were within method acceptance criteria.

TABLE OF CONTENTS

# Sample Inventory Report

| Vista Sample ID | Client Sample ID | Sampled | Received | Components/Containers |
|---|---|---|---|---|
| 1900110-01 | TS2-E-190111 | 11-Jan-19 16:15 | 14-Jan-19 07:54 | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |

# ANALYTICAL RESULTS

| **Sample ID:** | **Method Blank** | | **EPA Method 1699** |
|---|---|---|---|

Matrix: Aqueous
Sample Size: 1.00 L

QC Batch: B9A0130
Date Extracted: 16-Jan-2019 11:26

Lab Sample: B9A0130-BLK1
Date Analyzed: 25-Jan-19 22:27 Column: ZB-50

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 7.15 | | | J |
| alpha-BHC | ND | 2.89 | | |
| Lindane (gamma-BHC) | ND | 3.91 | | |
| beta-BHC | ND | 3.53 | | |
| delta-BHC | ND | 2.96 | | |
| Heptachlor | ND | 1.57 | | |
| Aldrin | ND | 2.33 | | |
| Oxychlordane | ND | 7.39 | | |
| cis-Heptachlor Epoxide | ND | 6.14 | | |
| trans-Heptachlor Epoxide | ND | 15.9 | | |
| trans-Chlordane (gamma) | ND | 6.79 | | |
| trans-Nonachlor | ND | 6.73 | | |
| cis-Chlordane (alpha) | ND | 6.78 | | |
| Endosulfan I (alpha) | ND | 9.53 | | |
| 2,4'-DDE | ND | 2.10 | | |
| 4,4'-DDE | ND | 2.48 | | |
| Dieldrin | ND | 1.86 | | |
| Endrin | ND | 2.57 | | |
| cis-Nonachlor | ND | 3.80 | | |
| Endosulfan II (beta) | ND | 6.13 | | |
| 2,4'-DDD | ND | 3.95 | | |
| 2,4'-DDT | ND | 7.48 | | |
| 4,4'-DDD | ND | 4.42 | | |
| 4,4'-DDT | ND | 7.07 | | |
| Endosulfan Sulfate | ND | 3.65 | | |
| 4,4'-Methoxychlor | ND | 2.25 | | |
| Mirex | ND | 1.08 | | |
| Endrin Aldehyde | ND | 2.37 | | |
| Endrin Ketone | ND | 3.27 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 65.3 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 81.2 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 85.9 | 11 - 120 | |
| IS | 13C6-beta-BHC | 86.3 | 32 - 130 | |
| IS | 13C6-delta-BHC | 88.7 | 36 - 137 | |
| IS | 13C10-Heptachlor | 94.0 | 5 - 120 | |
| IS | 13C12-Aldrin | 86.3 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 96.2 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 93.9 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 92.7 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 90.7 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 89.7 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 85.6 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 86.1 | 47 - 160 | |
| IS | 13C12-Dieldrin | 92.2 | 40 - 151 | |
| IS | 13C12-Endrin | 97.6 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 85.6 | 36 - 139 | |
| IS | 13C9-Endosulfan II (beta) | 82.3 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 91.2 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 81.4 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 88.2 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 86.2 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 86.3 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 79.0 | 5 - 120 | |
| IS | 13C10-Mirex | 72.0 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 70.6 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 86.5 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Vista Analytical Laboratory

## Sample ID: OPR

**EPA Method 1699**

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B9A0130 | Lab Sample: | B9A0130-BS1 |
| Sample Size: | 1.00 L | Date Extracted: | 16-Jan-2019 11:26 | Date Analyzed: | 25-Jan-19 20:48 Column: ZB-50 |

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits |
|---|---|---|---|---|
| Hexachlorobenzene | 971 | 1000 | 97.1 | 50 - 120 |
| alpha-BHC | 983 | 1000 | 98.3 | 50 - 120 |
| Lindane (gamma-BHC) | 970 | 1000 | 97.0 | 50 - 120 |
| beta-BHC | 1000 | 1000 | 100 | 50 - 120 |
| delta-BHC | 990 | 1000 | 99.0 | 50 - 120 |
| Heptachlor | 942 | 1000 | 94.2 | 50 - 120 |
| Aldrin | 978 | 1000 | 97.8 | 50 - 120 |
| Oxychlordane | 894 | 1000 | 89.4 | 50 - 120 |
| cis-Heptachlor Epoxide | 973 | 1000 | 97.3 | 50 - 120 |
| trans-Heptachlor Epoxide | 916 | 1000 | 91.6 | 50 - 120 |
| trans-Chlordane (gamma) | 950 | 1000 | 95.0 | 50 - 120 |
| trans-Nonachlor | 967 | 1000 | 96.7 | 50 - 120 |
| cis-Chlordane (alpha) | 964 | 1000 | 96.4 | 50 - 120 |
| Endosulfan I (alpha) | 944 | 1000 | 94.4 | 50 - 120 |
| 2,4'-DDE | 939 | 1000 | 93.9 | 24 - 123 |
| 4,4'-DDE | 970 | 1000 | 97.0 | 50 - 120 |
| Dieldrin | 973 | 1000 | 97.3 | 50 - 120 |
| Endrin | 991 | 1000 | 99.1 | 50 - 120 |
| cis-Nonachlor | 998 | 1000 | 99.8 | 50 - 120 |
| Endosulfan II (beta) | 955 | 1000 | 95.5 | 5 - 200 |
| 2,4'-DDD | 970 | 1000 | 97.0 | 50 - 120 |
| 2,4'-DDT | 1090 | 1000 | 109 | 50 - 120 |
| 4,4'-DDD | 969 | 1000 | 96.9 | 42 - 120 |
| 4,4'-DDT | 965 | 1000 | 96.5 | 50 - 120 |
| Endosulfan Sulfate | 927 | 1000 | 92.7 | 50 - 120 |
| 4,4'-Methoxychlor | 987 | 1000 | 98.7 | 50 - 120 |
| Mirex | 971 | 1000 | 97.1 | 50 - 120 |
| Endrin Aldehyde | 945 | 1000 | 94.5 | 50 - 134 |
| Endrin Ketone | 949 | 1000 | 94.9 | 50 - 134 |

| | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 69.3 | 5 - 120 |
| IS | 13C6-alpha-BHC | 83.2 | 17 - 141 |
| IS | 13C6-Lindane (gamma-BHC) | 89.5 | 5 - 124 |
| IS | 13C6-beta-BHC | 88.6 | 17 - 141 |
| IS | 13C6-delta-BHC | 91.3 | 16 - 150 |
| IS | 13C10-Heptachlor | 96.6 | 5 - 128 |
| IS | 13C12-Aldrin | 85.1 | 5 - 126 |
| IS | 13C10-Oxychlordane | 106 | 5 - 144 |
| IS | 13C10-cis-Heptachlor Epoxide | 102 | 8 - 146 |
| IS | 13C10-trans-Chlordane (gamma) | 97.4 | 15 - 144 |
| IS | 13C10-trans-Nonachlor | 98.7 | 13 - 149 |
| IS | 13C9-Endosulfan I (alpha) | 102 | 5 - 144 |
| IS | 13C12-2,4'-DDE | 90.5 | 26 - 169 |
| IS | 13C12-4,4'-DDE | 93.6 | 26 - 169 |
| IS | 13C12-Dieldrin | 100 | 19 - 161 |
| IS | 13C12-Endrin | 102 | 20 - 157 |
| IS | 13C10-cis-Nonachlor | 101 | 17 - 154 |
| IS | 13C9-Endosulfan II (beta) | 96.7 | 5 - 120 |
| IS | 13C12-2,4'-DDD | 107 | 14 - 200 |
| IS | 13C12-2,4'-DDT | 97.8 | 14 - 200 |
| IS | 13C12-4,4'-DDD | 109 | 14 - 200 |
| IS | 13C12-4,4'-DDT | 108 | 13 - 200 |
| IS | 13C9-Endosulfan Sulfate | 101 | 5 - 144 |
| IS | 13C12-Methoxychlor | 105 | 8 - 200 |
| IS | 13C10-Mirex | 87.2 | 5 - 138 |
| IS | 13C12-Endrin Aldehyde | 74.1 | 5 - 144 |
| IS | 13C12-Endrin Ketone | 94.8 | 5 - 144 |

LCL-UCL - Lower control limit - upper control limit

## Sample ID: TS2-E-190111 — EPA Method 1699

| Client Data | | Sample Data | | Laboratory Data | | | |
|---|---|---|---|---|---|---|---|
| Name: | CDIM Engineering | Matrix: | Water | Lab Sample: | 1900110-01 | Date Received: | 14-Jan-2019 7:54 |
| Project: | 101-003, Task 1 | Sample Size: | 0.979 L | QC Batch: | B9A0130 | Date Extracted: | 16-Jan-2019 11:26 |
| Date Collected: | 11-Jan-2019 16:15 | | | Date Analyzed: | 26-Jan-19 02:32 Column: ZB-50 | | |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers | | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|
| Hexachlorobenzene | 106 | | | B | IS | 13C6-Hexachlorobenzene | 71.4 | 5 - 120 | |
| alpha-BHC | 49.6 | | | | IS | 13C6-alpha-BHC | 70.7 | 32 - 130 | |
| Lindane (gamma-BHC) | 36.2 | | | J | IS | 13C6-Lindane (gamma-BHC) | 73.5 | 11 - 120 | |
| beta-BHC | 54.0 | | | | IS | 13C6-beta-BHC | 74.7 | 32 - 130 | |
| delta-BHC | 5.68 | | | J | IS | 13C6-delta-BHC | 75.0 | 36 - 137 | |
| Heptachlor | ND | 5.23 | | | IS | 13C10-Heptachlor | 88.6 | 5 - 120 | |
| Aldrin | ND | 13.9 | | | IS | 13C12-Aldrin | 73.9 | 5 - 120 | |
| Oxychlordane | ND | 44.5 | | | IS | 13C10-Oxychlordane | 82.0 | 23 - 135 | |
| cis-Heptachlor Epoxide | 84.8 | | | | IS | 13C10-cis-Heptachlor Epoxide | 79.5 | 27 - 137 | |
| trans-Heptachlor Epoxide | 428 | | | | IS | 13C10-trans-Chlordane (gamma) | 75.6 | 21 - 132 | |
| trans-Chlordane (gamma) | 311 | | | | IS | 13C10-trans-Nonachlor | 75.2 | 14 - 136 | |
| trans-Nonachlor | 173 | | | | IS | 13C9-Endosulfan I (alpha) | 75.5 | 15 - 148 | |
| cis-Chlordane (alpha) | 439 | | | | IS | 13C12-2,4'-DDE | 74.0 | 47 - 160 | |
| Endosulfan I (alpha) | ND | 57.0 | | | IS | 13C12-4,4'-DDE | 69.0 | 47 - 160 | |
| 2,4'-DDE | 99.6 | | | | IS | 13C12-Dieldrin | 70.3 | 40 - 151 | |
| 4,4'-DDE | 3450 | | | | IS | 13C12-Endrin | 68.1 | 35 - 155 | |
| Dieldrin | 1540 | | | | IS | 13C10-cis-Nonachlor | 62.0 | 36 - 139 | |
| Endrin | 597 | | | | IS | 13C9-Endosulfan II (beta) | 65.6 | 5 - 122 | |
| cis-Nonachlor | ND | 37.8 | | | IS | 13C12-2,4'-DDD | 75.1 | 5 - 199 | |
| Endosulfan II (beta) | ND | 53.1 | | | IS | 13C12-2,4'-DDT | 65.6 | 5 - 199 | |
| 2,4'-DDD | 644 | | | | IS | 13C12-4,4'-DDD | 69.4 | 5 - 120 | |
| 2,4'-DDT | 1140 | | | | IS | 13C12-4,4'-DDT | 68.5 | 5 - 120 | |
| 4,4'-DDD | 1420 | | | | IS | 13C9-Endosulfan Sulfate | 60.4 | 15 - 148 | |
| 4,4'-DDT | 4480 | | | | IS | 13C12-Methoxychlor | 49.6 | 5 - 120 | |
| Endosulfan Sulfate | ND | 65.0 | | | IS | 13C10-Mirex | 40.6 | 5 - 120 | |
| 4,4'-Methoxychlor | ND | 147 | | | IS | 13C12-Endrin Aldehyde | 48.1 | 15 - 148 | |
| Mirex | ND | 10.0 | | | IS | 13C12-Endrin Ketone | 52.9 | 15 - 148 | |
| Endrin Aldehyde | ND | 29.5 | | | | | | | |
| Endrin Ketone | 545 | | | | | | | | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

# DATA QUALIFIERS & ABBREVIATIONS

| | |
|---|---|
| B | This compound was also detected in the method blank |
| Conc. | Concentration |
| D | Dilution |
| DL | Detection limit |
| E | The associated compound concentration exceeded the calibration range of the instrument |
| H | Recovery and/or RPD was outside laboratory acceptance limits |
| I | Chemical Interference |
| J | The amount detected is below the Reporting Limit/LOQ |
| LOD | Limits of Detection |
| LOQ | Limits of Quantitation |
| M | Estimated Maximum Possible Concentration (CA Region 2 projects only) |
| NA | Not applicable |
| ND | Not Detected |
| P | The reported concentration may include contribution from chlorinated diphenyl ether(s). |
| Q | Ion ratio outside of 70-130% of Standard Ratio. |
| TEQ | Toxic Equivalency |
| U | Not Detected (specific projects only) |
| * | See Cover Letter |

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

**Vista Analytical Laboratory Certifications**

| Accrediting Authority | Certificate Number |
|---|---|
| Alaska Department of Environmental Conservation | 17-013 |
| Arkansas Department of Environmental Quality | 19-013-0 |
| California Department of Health – ELAP | 2892 |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005 | 3091.01 |
| Florida Department of Health | E87777 |
| Hawaii Department of Health | N/A |
| Louisiana Department of Environmental Quality | 01977 |
| Maine Department of Health | 2018017 |
| Michigan Department of Environmental Quality | 9932 |
| Minnesota Department of Health | 1521520 |
| New Hampshire Environmental Accreditation Program | 207718 |
| New Jersey Department of Environmental Protection | CA003 |
| New York Department of Health | 11411 |
| Oregon Laboratory Accreditation Program | 4042-009 |
| Pennsylvania Department of Environmental Protection | 015 |
| Texas Commission on Environmental Quality | T104704189-18-9 |
| Virginia Department of General Services | 9618 |
| Washington Department of Ecology | C584-18 |
| Wisconsin Department of Natural Resources | 998036160 |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

| MATRIX: Air | |
|---|---|
| **Description of Test** | **Method** |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23 |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water | |
|---|---|
| **Description of Test** | **Method** |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS | EPA 522 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Dioxin by GC/HRMS | EPA 613 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids | |
|---|---|
| **Description of Test** | **Method** |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613 |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

CHAIN OF CUSTODY RECORD

1900110 0.5°C

| | | |
|---|---|---|
| **LABORATORY:** Vista Analytical, 1104 Windfield Way, El Dorado Hills CA 95762, (916) 673-1520, Karen Volpendesta | **INSTRUCTIONS FOR LAB PERSONNEL:** Please send analytic results, electronic deliverables and the original chain-of-custody form to: bas@cdimengineering.com, mec@cdimengineering.com, sab@cdimengineering.com | Analysis Turnaroud Time X Standard □ Other ____; GeoTracker EDF required? □ Yes X No; LOCUS EDD required? □ Yes X No; Report Results to: □ RL X MDL; Report soil results to: □ wet weight (total) □ dry weight |

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**PROJECT INFORMATION**

**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

**ANALYSIS REQUESTED**

COC Number:
Page 1 of 1
SDG number:

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | Pesticides (EPA 1699) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|
| | **TS2-E-190111** | 1/11/2019 | 1615 | W | 3 | X | |
| **Field Filtered (X):** | | | | | | | |
| Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other ____ | | | | | | 1 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | CDIM | 1/11/19 2031 | Kam Elkie ○ | VAL | 1/14/19 0754 |
| | | | ○ | | |
| | | | ○ | | |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 808 256 9230 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 1/11/19 2031 |

Vista Analytical Laboratory

# Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1900110 TAT Std

| | | | |
|---|---|---|---|
| **Samples Arrival:** | **Date/Time** 1/14/19 0754 | **Initials:** KE | **Location:** WR-2 **Shelf/Rack:** NA |
| **Logged In:** | **Date/Time** 1/14/19 0911 | **Initials:** KE | **Location:** WR-2 **Shelf/Rack:** C-2 |

| **Delivered By:** | FedEx | UPS | On Trac | GSO | DHL | Hand Delivered | Other |
|---|---|---|---|---|---|---|---|
| **Preservation:** | Ice | | Blue Ice | | Dry Ice | | None |

| | | |
|---|---|---|
| **Temp °C:** 0.6 **(uncorrected)** | **Probe used: Y / N** | **Thermometer ID:** IR-4 |
| **Temp °C:** 0.5 **(corrected)** | | |

| | YES | NO | NA |
|---|---|---|---|
| Adequate Sample Volume Received? | ✓ | | |
| Holding Time Acceptable? | ✓ | | |
| Shipping Container(s) Intact? | ✓ | | |
| Shipping Custody Seals Intact? | | | ✓ |
| Shipping Documentation Present? | ✓ | | |
| Airbill F.O. / Trk # 7849 3524 8170 | ✓ | | |
| Sample Container Intact? | ✓ | | |
| Sample Custody Seals Intact? | | | ✓ |
| Chain of Custody / Sample Documentation Present? | ✓ | | |
| COC Anomaly/Sample Acceptance Form completed? | | | ✓ |

| | | | | |
|---|---|---|---|---|
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? | | | | ✓ |
| Preservation Documented: | $Na_2S_2O_3$ Trizma None Other | Yes | No | NA |

| Shipping Container | Vista | Client | Retain | Return | Dispose |
|---|---|---|---|---|---|

*Comments:*

January 29, 2019

**Vista Work Order No. 1900109**

Mr. Scott Bourne
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, CA 94102

Dear Mr. Bourne,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on January 14, 2019 under your Project Name '101-003, Task 1'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

**Vista Work Order No. 1900109**
**Case Narrative**

**Sample Condition on Receipt:**

One water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

**Analytical Notes:**

**EPA Method 1699**

The sample was extracted and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside the method acceptance criteria are listed in the table below:

QC Anomalies

| LabNumber | SampleName | Analysis | Analyte | Flag | %Rec |
|---|---|---|---|---|---|
| 1900109-01 | TS2-I-190111 | EPA Method 1699 | 13C12-2,4'-DDE | H | 44.2 |
| 1900109-01 | TS2-I-190111 | EPA Method 1699 | 13C12-4,4'-DDE | H | 33.6 |
| 1900109-01 | TS2-I-190111 | EPA Method 1699 | 13C12-Dieldrin | H | 36.7 |
| 1900109-01 | TS2-I-190111 | EPA Method 1699 | 13C12-Endrin | H | 33.5 |
| 1900109-01 | TS2-I-190111 | EPA Method 1699 | 13C10-cis-Nonachlor | H | 25.0 |

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

# Sample Inventory Report

| Vista Sample ID | Client Sample ID | Sampled | Received | Components/Containers |
|---|---|---|---|---|
| 1900109-01 | TS2-I-190111 | 11-Jan-19 16:05 | 14-Jan-19 07:54 | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |

Vista Project: 1900109

Client Project: 101-003, Task 1

# ANALYTICAL RESULTS

## Sample ID: Method Blank — EPA Method 1699

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B9A0130 | Lab Sample: | B9A0130-BLK1 |
| Sample Size: | 1.00 L | Date Extracted: | 16-Jan-2019 11:26 | Date Analyzed: | 25-Jan-19 22:27 Column: ZB-50 |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 7.15 | | | J |
| alpha-BHC | ND | 2.89 | | |
| Lindane (gamma-BHC) | ND | 3.91 | | |
| beta-BHC | ND | 3.53 | | |
| delta-BHC | ND | 2.96 | | |
| Heptachlor | ND | 1.57 | | |
| Aldrin | ND | 2.33 | | |
| Oxychlordane | ND | 7.39 | | |
| cis-Heptachlor Epoxide | ND | 6.14 | | |
| trans-Heptachlor Epoxide | ND | 15.9 | | |
| trans-Chlordane (gamma) | ND | 6.79 | | |
| trans-Nonachlor | ND | 6.73 | | |
| cis-Chlordane (alpha) | ND | 6.78 | | |
| Endosulfan I (alpha) | ND | 9.53 | | |
| 2,4'-DDE | ND | 2.10 | | |
| 4,4'-DDE | ND | 2.48 | | |
| Dieldrin | ND | 1.86 | | |
| Endrin | ND | 2.57 | | |
| cis-Nonachlor | ND | 3.80 | | |
| Endosulfan II (beta) | ND | 6.13 | | |
| 2,4'-DDD | ND | 3.95 | | |
| 2,4'-DDT | ND | 7.48 | | |
| 4,4'-DDD | ND | 4.42 | | |
| 4,4'-DDT | ND | 7.07 | | |
| Endosulfan Sulfate | ND | 3.65 | | |
| 4,4'-Methoxychlor | ND | 2.25 | | |
| Mirex | ND | 1.08 | | |
| Endrin Aldehyde | ND | 2.37 | | |
| Endrin Ketone | ND | 3.27 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 65.3 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 81.2 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 85.9 | 11 - 120 | |
| IS | 13C6-beta-BHC | 86.3 | 32 - 130 | |
| IS | 13C6-delta-BHC | 88.7 | 36 - 137 | |
| IS | 13C10-Heptachlor | 94.0 | 5 - 120 | |
| IS | 13C12-Aldrin | 86.3 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 96.2 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 93.9 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 92.7 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 90.7 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 89.7 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 85.6 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 86.1 | 47 - 160 | |
| IS | 13C12-Dieldrin | 92.2 | 40 - 151 | |
| IS | 13C12-Endrin | 97.6 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 85.6 | 36 - 139 | |
| IS | 13C9-Endosulfan II (beta) | 82.3 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 91.2 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 81.4 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 88.2 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 86.2 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 86.3 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 79.0 | 5 - 120 | |
| IS | 13C10-Mirex | 72.0 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 70.6 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 86.5 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Vista Analytical Laboratory

## Sample ID: OPR

## EPA Method 1699

| | | | | | |
|---|---|---|---|---|---|
| Matrix: | Aqueous | QC Batch: | B9A0130 | Lab Sample: | B9A0130-BS1 |
| Sample Size: | 1.00 L | Date Extracted: | 16-Jan-2019 11:26 | Date Analyzed: | 25-Jan-19 20:48 Column: ZB-50 |

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits |
|---|---|---|---|---|
| Hexachlorobenzene | 971 | 1000 | 97.1 | 50 - 120 |
| alpha-BHC | 983 | 1000 | 98.3 | 50 - 120 |
| Lindane (gamma-BHC) | 970 | 1000 | 97.0 | 50 - 120 |
| beta-BHC | 1000 | 1000 | 100 | 50 - 120 |
| delta-BHC | 990 | 1000 | 99.0 | 50 - 120 |
| Heptachlor | 942 | 1000 | 94.2 | 50 - 120 |
| Aldrin | 978 | 1000 | 97.8 | 50 - 120 |
| Oxychlordane | 894 | 1000 | 89.4 | 50 - 120 |
| cis-Heptachlor Epoxide | 973 | 1000 | 97.3 | 50 - 120 |
| trans-Heptachlor Epoxide | 916 | 1000 | 91.6 | 50 - 120 |
| trans-Chlordane (gamma) | 950 | 1000 | 95.0 | 50 - 120 |
| trans-Nonachlor | 967 | 1000 | 96.7 | 50 - 120 |
| cis-Chlordane (alpha) | 964 | 1000 | 96.4 | 50 - 120 |
| Endosulfan I (alpha) | 944 | 1000 | 94.4 | 50 - 120 |
| 2,4'-DDE | 939 | 1000 | 93.9 | 24 - 123 |
| 4,4'-DDE | 970 | 1000 | 97.0 | 50 - 120 |
| Dieldrin | 973 | 1000 | 97.3 | 50 - 120 |
| Endrin | 991 | 1000 | 99.1 | 50 - 120 |
| cis-Nonachlor | 998 | 1000 | 99.8 | 50 - 120 |
| Endosulfan II (beta) | 955 | 1000 | 95.5 | 5 - 200 |
| 2,4'-DDD | 970 | 1000 | 97.0 | 50 - 120 |
| 2,4'-DDT | 1090 | 1000 | 109 | 50 - 120 |
| 4,4'-DDD | 969 | 1000 | 96.9 | 42 - 120 |
| 4,4'-DDT | 965 | 1000 | 96.5 | 50 - 120 |
| Endosulfan Sulfate | 927 | 1000 | 92.7 | 50 - 120 |
| 4,4'-Methoxychlor | 987 | 1000 | 98.7 | 50 - 120 |
| Mirex | 971 | 1000 | 97.1 | 50 - 120 |
| Endrin Aldehyde | 945 | 1000 | 94.5 | 50 - 134 |
| Endrin Ketone | 949 | 1000 | 94.9 | 50 - 134 |

| | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 69.3 | 5 - 120 |
| IS | 13C6-alpha-BHC | 83.2 | 17 - 141 |
| IS | 13C6-Lindane (gamma-BHC) | 89.5 | 5 - 124 |
| IS | 13C6-beta-BHC | 88.6 | 17 - 141 |
| IS | 13C6-delta-BHC | 91.3 | 16 - 150 |
| IS | 13C10-Heptachlor | 96.6 | 5 - 128 |
| IS | 13C12-Aldrin | 85.1 | 5 - 126 |
| IS | 13C10-Oxychlordane | 106 | 5 - 144 |
| IS | 13C10-cis-Heptachlor Epoxide | 102 | 8 - 146 |
| IS | 13C10-trans-Chlordane (gamma) | 97.4 | 15 - 144 |
| IS | 13C10-trans-Nonachlor | 98.7 | 13 - 149 |
| IS | 13C9-Endosulfan I (alpha) | 102 | 5 - 144 |
| IS | 13C12-2,4'-DDE | 90.5 | 26 - 169 |
| IS | 13C12-4,4'-DDE | 93.6 | 26 - 169 |
| IS | 13C12-Dieldrin | 100 | 19 - 161 |
| IS | 13C12-Endrin | 102 | 20 - 157 |
| IS | 13C10-cis-Nonachlor | 101 | 17 - 154 |
| IS | 13C9-Endosulfan II (beta) | 96.7 | 5 - 120 |
| IS | 13C12-2,4'-DDD | 107 | 14 - 200 |
| IS | 13C12-2,4'-DDT | 97.8 | 14 - 200 |
| IS | 13C12-4,4'-DDD | 109 | 14 - 200 |
| IS | 13C12-4,4'-DDT | 108 | 13 - 200 |
| IS | 13C9-Endosulfan Sulfate | 101 | 5 - 144 |
| IS | 13C12-Methoxychlor | 105 | 8 - 200 |
| IS | 13C10-Mirex | 87.2 | 5 - 138 |
| IS | 13C12-Endrin Aldehyde | 74.1 | 5 - 144 |
| IS | 13C12-Endrin Ketone | 94.8 | 5 - 144 |

LCL-UCL - Lower control limit - upper control limit

## Sample ID: TS2-I-190111 — EPA Method 1699

| Client Data | | Sample Data | | Laboratory Data | | | |
|---|---|---|---|---|---|---|---|
| Name: | CDIM Engineering | Matrix: | Water | Lab Sample: | 1900109-01 | Date Received: | 14-Jan-2019 7:54 |
| Project: | 101-003, Task 1 | Sample Size: | 0.988 L | QC Batch: | B9A0130 | Date Extracted: | 16-Jan-2019 11:26 |
| Date Collected: | 11-Jan-2019 16:05 | | | Date Analyzed: | 26-Jan-19 04:11 | Column: | ZB-50 |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 1230 | | | B |
| alpha-BHC | 51.0 | | | |
| Lindane (gamma-BHC) | 45.7 | | | |
| beta-BHC | 69.6 | | | |
| delta-BHC | ND | 11.7 | | |
| Heptachlor | 37.0 | | | J |
| Aldrin | 43.8 | | | |
| Oxychlordane | ND | 102 | | |
| cis-Heptachlor Epoxide | 293 | | | |
| trans-Heptachlor Epoxide | 1020 | | | |
| trans-Chlordane (gamma) | 1840 | | | |
| trans-Nonachlor | 1040 | | | |
| cis-Chlordane (alpha) | 2820 | | | |
| Endosulfan I (alpha) | ND | 152 | | |
| 2,4'-DDE | 693 | | | |
| 4,4'-DDE | 9860 | | | |
| Dieldrin | 3670 | | | |
| Endrin | 651 | | | |
| cis-Nonachlor | 294 | | | |
| Endosulfan II (beta) | ND | 325 | | |
| 2,4'-DDD | 4960 | | | |
| 2,4'-DDT | 3860 | | | |
| 4,4'-DDD | 10400 | | | |
| 4,4'-DDT | 10800 | | | |
| Endosulfan Sulfate | ND | 437 | | |
| 4,4'-Methoxychlor | ND | 1140 | | |
| Mirex | ND | 67.3 | | |
| Endrin Aldehyde | ND | 166 | | |
| Endrin Ketone | ND | 498 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 84.9 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 76.5 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 89.4 | 11 - 120 | |
| IS | 13C6-beta-BHC | 73.9 | 32 - 130 | |
| IS | 13C6-delta-BHC | 72.0 | 36 - 137 | |
| IS | 13C10-Heptachlor | 96.5 | 5 - 120 | |
| IS | 13C12-Aldrin | 48.7 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 63.2 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 55.1 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 43.6 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 45.9 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 45.8 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 44.2 | 47 - 160 | H |
| IS | 13C12-4,4'-DDE | 33.6 | 47 - 160 | H |
| IS | 13C12-Dieldrin | 36.7 | 40 - 151 | H |
| IS | 13C12-Endrin | 33.5 | 35 - 155 | H |
| IS | 13C10-cis-Nonachlor | 25.0 | 36 - 139 | H |
| IS | 13C9-Endosulfan II (beta) | 34.3 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 37.1 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 26.4 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 25.9 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 20.4 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 21.4 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 15.7 | 5 - 120 | |
| IS | 13C10-Mirex | 18.6 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 20.0 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 15.6 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

# DATA QUALIFIERS & ABBREVIATIONS

| | |
|---|---|
| B | This compound was also detected in the method blank |
| Conc. | Concentration |
| D | Dilution |
| DL | Detection limit |
| E | The associated compound concentration exceeded the calibration range of the instrument |
| H | Recovery and/or RPD was outside laboratory acceptance limits |
| I | Chemical Interference |
| J | The amount detected is below the Reporting Limit/LOQ |
| LOD | Limits of Detection |
| LOQ | Limits of Quantitation |
| M | Estimated Maximum Possible Concentration (CA Region 2 projects only) |
| NA | Not applicable |
| ND | Not Detected |
| P | The reported concentration may include contribution from chlorinated diphenyl ether(s). |
| Q | Ion ratio outside of 70-130% of Standard Ratio. |
| TEQ | Toxic Equivalency |
| U | Not Detected (specific projects only) |
| * | See Cover Letter |

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

**Vista Analytical Laboratory Certifications**

| Accrediting Authority | Certificate Number |
|---|---|
| Alaska Department of Environmental Conservation | 17-013 |
| Arkansas Department of Environmental Quality | 19-013-0 |
| California Department of Health – ELAP | 2892 |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005 | 3091.01 |
| Florida Department of Health | E87777 |
| Hawaii Department of Health | N/A |
| Louisiana Department of Environmental Quality | 01977 |
| Maine Department of Health | 2018017 |
| Michigan Department of Environmental Quality | 9932 |
| Minnesota Department of Health | 1521520 |
| New Hampshire Environmental Accreditation Program | 207718 |
| New Jersey Department of Environmental Protection | CA003 |
| New York Department of Health | 11411 |
| Oregon Laboratory Accreditation Program | 4042-009 |
| Pennsylvania Department of Environmental Protection | 015 |
| Texas Commission on Environmental Quality | T104704189-18-9 |
| Virginia Department of General Services | 9618 |
| Washington Department of Ecology | C584-18 |
| Wisconsin Department of Natural Resources | 998036160 |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

| MATRIX: Air | |
|---|---|
| **Description of Test** | **Method** |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23 |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water | |
|---|---|
| **Description of Test** | **Method** |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS | EPA 522 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Dioxin by GC/HRMS | EPA 613 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids | |
|---|---|
| **Description of Test** | **Method** |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613 |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

1900109 0.5°C

**LABORATORY:**
Vista Analytical
1104 Windfield Way, El Dorado Hills CA 95762
(916) 673-1520
Karen Volpendesta

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaroud Time X Standard □ Other
GeoTracker EDF required? □ Yes X No
LOCUS EDD required? □ Yes X No
Report Results to: □ RL X MDL
Report soil results to: □ wet weight (total) □ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**PROJECT INFORMATION**
**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

ANALYSIS REQUESTED

COC Number:

Page 1 of 1

SDG number:

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | Pesticides (EPA 1699) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|
| | TS2-I-190111 | 1/11/2019 | 1605 | W | 3 | X | |
| | | | | | Field Filtered (X): | | |
| | Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | 1 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | CDIM | 1/11/19 2031 | Kim Enc | VAL | 1/14/19 0754 |
| | | | | | |
| | | | | | |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 808 256 9230 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 1/11/19 2031 |

Vista Analytical Laboratory

# Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1900109

TAT std

| | | | |
|---|---|---|---|
| **Samples Arrival:** | **Date/Time** 1/14/19 0754 | **Initials:** KE | **Location:** WR-2<br>**Shelf/Rack:** NA |
| **Logged In:** | **Date/Time** 1/14/19 0830 | **Initials:** KE | **Location:** WR-2<br>**Shelf/Rack:** C2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Delivered By:** | FedEx | UPS | On Trac | GSO | DHL | Hand Delivered | Other |
| **Preservation:** | Ice | | Blue Ice | | Dry Ice | | None |

| | | |
|---|---|---|
| **Temp °C:** 0.6 **(uncorrected)** | **Probe used:** Y / N | **Thermometer ID:** FR4 |
| **Temp °C:** 0.5 **(corrected)** | | |

| | YES | NO | NA |
|---|---|---|---|
| Adequate Sample Volume Received? | ✓ | | |
| Holding Time Acceptable? | ✓ | | |
| Shipping Container(s) Intact? | ✓ | | |
| Shipping Custody Seals Intact? | | | ✓ |
| Shipping Documentation Present? | ✓ | | |
| Airbill F.O. Trk # 7849 3524 8170 | ✓ | | |
| Sample Container Intact? | ✓ | | |
| Sample Custody Seals Intact? | | | ✓ |
| Chain of Custody / Sample Documentation Present? | ✓ | | |
| COC Anomaly/Sample Acceptance Form completed? | | ✓ | ✓ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? | | | | | | | ✓ |
| Preservation Documented: | $Na_2S_2O_3$ Trizma None Other | | | | Yes | No | NA |
| Shipping Container | Vista | Client | Retain | | Return | | Dispose |

*Comments:*

# ANALYTICAL REPORT

February 11, 2019

## CDIM Engineering - San Francisco, CA

| | |
|---|---|
| Sample Delivery Group: | L1066144 |
| Samples Received: | 02/01/2019 |
| Project Number: | 101-003 TASK 1 |
| Description: | LRTC 2018-2019 Industrial Stormwater |
| | |
| Report To: | Mary Cunningham<br>45 Polk Street<br>3rd Floor<br>San Francisco, CA 94102 |

Entire Report Reviewed By:

Brian Ford
Project Manager



# TABLE OF CONTENTS

## TS1-E-190131 L1066144-01 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/31/19 08:00 | 02/01/19 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1231948 | 1 | 02/05/19 12:51 | 02/05/19 13:32 | AEC |
| Wet Chemistry by Method 1664A | WG1233342 | 1 | 02/06/19 08:27 | 02/06/19 16:51 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1231870 | 1 | 02/03/19 09:22 | 02/03/19 09:22 | TH |
| Metals (ICPMS) by Method 200.8 | WG1231915 | 1 | 02/04/19 15:07 | 02/05/19 14:42 | JPD |

## TS2-E-190131 L1066144-02 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/31/19 08:35 | 02/01/19 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1231948 | 1 | 02/05/19 12:51 | 02/05/19 13:32 | AEC |
| Wet Chemistry by Method 1664A | WG1233342 | 1 | 02/06/19 08:27 | 02/06/19 16:51 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1231870 | 1 | 02/03/19 09:22 | 02/03/19 09:22 | TH |
| Metals (ICPMS) by Method 200.8 | WG1231915 | 1 | 02/04/19 15:07 | 02/05/19 14:47 | JPD |

## TS3-E-190131 L1066144-03 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/31/19 09:05 | 02/01/19 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1231948 | 1 | 02/05/19 12:51 | 02/05/19 13:32 | AEC |
| Wet Chemistry by Method 1664A | WG1233342 | 1 | 02/06/19 08:27 | 02/06/19 16:51 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1231870 | 1 | 02/03/19 09:22 | 02/03/19 09:22 | TH |
| Metals (ICPMS) by Method 200.8 | WG1231915 | 1 | 02/04/19 15:07 | 02/05/19 14:51 | JPD |

## TS4-E-190131 L1066144-04 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/31/19 09:40 | 02/01/19 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1231948 | 1 | 02/05/19 12:51 | 02/05/19 13:32 | AEC |
| Wet Chemistry by Method 1664A | WG1233342 | 1 | 02/06/19 08:27 | 02/06/19 16:51 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1231870 | 1 | 02/03/19 09:22 | 02/03/19 09:22 | TH |
| Metals (ICPMS) by Method 200.8 | WG1231915 | 1 | 02/04/19 15:07 | 02/05/19 14:56 | JPD |

## TSX-E-190131 L1066144-05 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/31/19 09:05 | 02/01/19 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1231948 | 1 | 02/05/19 12:51 | 02/05/19 13:32 | AEC |
| Gravimetric Analysis by Method 2540 D-2011 | WG1234743 | 1 | 02/09/19 12:32 | 02/09/19 12:54 | AJS |
| Wet Chemistry by Method 1664A | WG1233342 | 1 | 02/06/19 08:27 | 02/06/19 16:51 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1234767 | 1 | 02/09/19 12:15 | 02/09/19 12:15 | MLW |
| Metals (ICPMS) by Method 200.8 | WG1231915 | 1 | 02/04/19 15:07 | 02/04/19 23:42 | LAT |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Project Manager

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 | 1 | 02/05/2019 13:32 | WG1231948 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 797 | 5490 | 1 | 02/06/2019 16:51 | WG1233342 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.79 | T8 | 1 | 02/03/2019 09:22 | WG1231870 |

**Sample Narrative:**

L1066144-01 WG1231870: 7.79 at 15.4C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 35.1 | J | 20.0 | 100 | 1 | 02/05/2019 14:42 | WG1231915 |
| Iron | 19.9 | J | 15.0 | 100 | 1 | 02/05/2019 14:42 | WG1231915 |
| Lead | 0.845 | J | 0.260 | 1.00 | 1 | 02/05/2019 14:42 | WG1231915 |
| Zinc | 44.6 | | 1.91 | 10.0 | 1 | 02/05/2019 14:42 | WG1231915 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 800 | J | 350 | 2500 | 1 | 02/05/2019 13:32 | WG1231948 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 1010 | J | 815 | 5620 | 1 | 02/06/2019 16:51 | WG1233342 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.86 | T8 | 1 | 02/03/2019 09:22 | WG1231870 |

**Sample Narrative:**

L1066144-02 WG1231870: 7.86 at 15.8C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 41.3 | J | 20.0 | 100 | 1 | 02/05/2019 14:47 | WG1231915 |
| Iron | 242 | | 15.0 | 100 | 1 | 02/05/2019 14:47 | WG1231915 |
| Lead | 0.966 | J | 0.260 | 1.00 | 1 | 02/05/2019 14:47 | WG1231915 |
| Zinc | 61.7 | | 1.91 | 10.0 | 1 | 02/05/2019 14:47 | WG1231915 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 | 1 | 02/05/2019 13:32 | WG1231948 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 833 | 5750 | 1 | 02/06/2019 16:51 | WG1233342 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.41 | T8 | 1 | 02/03/2019 09:22 | WG1231870 |

**Sample Narrative:**

L1066144-03 WG1231870: 7.41 at 16.5C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 22.5 | J | 20.0 | 100 | 1 | 02/05/2019 14:51 | WG1231915 |
| Iron | 94.1 | J | 15.0 | 100 | 1 | 02/05/2019 14:51 | WG1231915 |
| Lead | 2.91 | | 0.260 | 1.00 | 1 | 02/05/2019 14:51 | WG1231915 |
| Zinc | 64.6 | | 1.91 | 10.0 | 1 | 02/05/2019 14:51 | WG1231915 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 820 | J | 361 | 2580 | 1 | 02/05/2019 13:32 | WG1231948 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 780 | 5380 | 1 | 02/06/2019 16:51 | WG1233342 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.51 | T8 | 1 | 02/03/2019 09:22 | WG1231870 |

**Sample Narrative:**

L1066144-04 WG1231870: 7.51 at 17.1C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 | 1 | 02/05/2019 14:56 | WG1231915 |
| Iron | 233 | | 15.0 | 100 | 1 | 02/05/2019 14:56 | WG1231915 |
| Lead | 0.555 | J | 0.260 | 1.00 | 1 | 02/05/2019 14:56 | WG1231915 |
| Zinc | 34.0 | | 1.91 | 10.0 | 1 | 02/05/2019 14:56 | WG1231915 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 | 1 | 02/05/2019 13:32 | WG1231948 |
| Suspended Solids | U | T8 | 777 | 5550 | 1 | 02/09/2019 12:54 | WG1234743 |

**Sample Narrative:**

L1066144-05 WG1234743: Duplicate analysis performed out of hold.

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 833 | 5750 | 1 | 02/06/2019 16:51 | WG1233342 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.10 | T8 | 1 | 02/09/2019 12:15 | WG1234767 |

**Sample Narrative:**

L1066144-05 WG1234767: 7.1 at 10.5C.

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 | 1 | 02/04/2019 23:42 | WG1231915 |
| Iron | 75.7 | J | 15.0 | 100 | 1 | 02/04/2019 23:42 | WG1231915 |
| Lead | 2.95 | | 0.260 | 1.00 | 1 | 02/04/2019 23:42 | WG1231915 |
| Zinc | 68.8 | | 1.91 | 10.0 | 1 | 02/04/2019 23:42 | WG1231915 |

## Method Blank (MB)

(MB) R3381465-1 02/05/19 13:32

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 |

## L1066021-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1066021-01 02/05/19 13:32 • (DUP) R3381465-3 02/05/19 13:32

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 87000 | 84000 | 1 | 3.51 | | 5 |

## L1066157-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1066157-01 02/05/19 13:32 • (DUP) R3381465-4 02/05/19 13:32

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 122000 | 117000 | 1 | 4.18 | | 5 |

## Laboratory Control Sample (LCS)

(LCS) R3381465-2 02/05/19 13:32

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Suspended Solids | 773000 | 856000 | 111 | 85.0-115 | |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3382529-1 02/09/19 12:54

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 |

## L1066144-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1066144-05 02/09/19 12:54 • (DUP) R3382529-3 02/09/19 12:54

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | U | 0.000 | 1 | 0.000 | | 5 |

**Sample Narrative:**

OS: Duplicate analysis performed out of hold.

## Laboratory Control Sample (LCS)

(LCS) R3382529-2 02/09/19 12:54

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Suspended Solids | 773000 | 820000 | 106 | 85.0-115 | |

## Method Blank (MB)

(MB) R3381744-1 02/06/19 16:51

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| TPH - Oil & Grease | U | | 725 | 5000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3381744-2 02/06/19 16:51 • (LCSD) R3381744-3 02/06/19 16:51

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 20000 | 19100 | 20000 | 95.5 | 100 | 64.0-132 | | | 4.60 | 34 |

## L1066144-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1066144-05 02/06/19 16:51 • (MS) R3381744-4 02/06/19 16:51 • (MSD) R3381744-5 02/06/19 16:51

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 20000 | U | 18500 | 18600 | 92.6 | 93.1 | 1 | 64.0-132 | | | 0.539 | 34 |

## L1065989-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1065989-04 02/03/19 09:22 • (DUP) R3380816-2 02/03/19 09:22

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 6.70 | 6.71 | 1 | 0.149 | | 1 |

Sample Narrative:

OS: 6.7 at 17.4C

DUP: 6.71 at 17.3C

## L1066202-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1066202-01 02/03/19 09:22 • (DUP) R3380816-3 02/03/19 09:22

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 7.34 | 7.36 | 1 | 0.272 | | 1 |

Sample Narrative:

OS: 7.34 at 16.5C

DUP: 7.36 at 16.5C

## Laboratory Control Sample (LCS)

(LCS) R3380816-1 02/03/19 09:22

| Analyte | Spike Amount su | LCS Result su | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| pH | 10.0 | 9.98 | 99.8 | 99.0-101 | |

Sample Narrative:

LCS: 9.98 at 19.1C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## L1066144-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1066144-05 02/09/19 12:15 • (DUP) R3382428-2 02/09/19 12:15

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 7.10 | 7.10 | 1 | 0.000 | | 1 |

Sample Narrative:

OS: 7.1 at 10.5C.

DUP: 7.1 at 10.9C

## Laboratory Control Sample (LCS)

(LCS) R3382428-1 02/09/19 12:15

| Analyte | Spike Amount su | LCS Result su | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| pH | 10.0 | 9.97 | 99.7 | 99.0-101 | |

Sample Narrative:

LCS: 9.97 at 17.7C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3381258-1 02/04/19 23:11

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 |
| Iron | U | | 15.0 | 100 |
| Lead | U | | 0.260 | 1.00 |
| Zinc | U | | 1.91 | 10.0 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3381258-2 02/04/19 23:15 • (LCSD) R3381258-3 02/04/19 23:20

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 4740 | 4770 | 94.8 | 95.4 | 85.0-115 | | | 0.591 | 20 |
| Iron | 5000 | 4740 | 4760 | 94.7 | 95.1 | 85.0-115 | | | 0.386 | 20 |
| Lead | 50.0 | 47.2 | 48.4 | 94.4 | 96.8 | 85.0-115 | | | 2.55 | 20 |
| Zinc | 50.0 | 49.8 | 50.6 | 99.6 | 101 | 85.0-115 | | | 1.62 | 20 |

## L1066091-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1066091-01 02/04/19 23:24 • (MS) R3381258-5 02/04/19 23:33 • (MSD) R3381258-6 02/04/19 23:38

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 354 | 5250 | 5260 | 97.9 | 98.1 | 1 | 70.0-130 | | | 0.207 | 20 |
| Iron | 5000 | 500 | 5270 | 5290 | 95.4 | 95.9 | 1 | 70.0-130 | | | 0.431 | 20 |
| Lead | 50.0 | ND | 48.6 | 49.3 | 95.7 | 97.0 | 1 | 70.0-130 | | | 1.39 | 20 |
| Zinc | 50.0 | 11.6 | 60.5 | 62.3 | 98.0 | 102 | 1 | 70.0-130 | | | 2.92 | 20 |

## L1066144-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1066144-05 02/04/19 23:42 • (MS) R3381258-7 02/04/19 23:47 • (MSD) R3381258-8 02/04/19 23:52

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | U | 4820 | 4980 | 96.5 | 99.6 | 1 | 70.0-130 | | | 3.18 | 20 |
| Iron | 5000 | 75.7 | 4790 | 5010 | 94.3 | 98.6 | 1 | 70.0-130 | | | 4.41 | 20 |
| Lead | 50.0 | 2.95 | 51.6 | 54.3 | 97.4 | 103 | 1 | 70.0-130 | | | 5.02 | 20 |
| Zinc | 50.0 | 68.8 | 117 | 119 | 96.9 | 100 | 1 | 70.0-130 | | | 1.30 | 20 |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| ND | Not detected at the Reporting Limit (or MDL where applicable). |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| T8 | Sample(s) received past/too close to holding time expiration. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO00356 |
| Kentucky [1,6] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1,4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

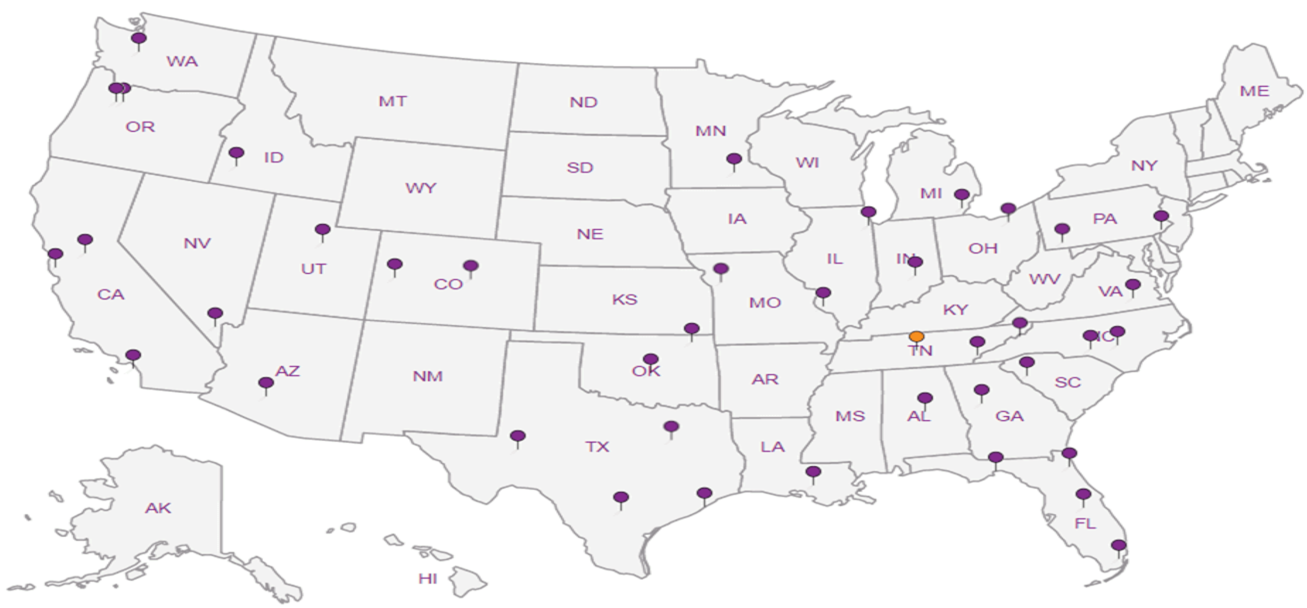
## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

H220

**LABORATORY:**
ESC Laboratory
12065 Lebanon Road, Mt. Juliet, TN 37122
(615) 773-9772
Brian Ford

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

Analysis Turnaround Time: X Standard ☐ Other
GeoTracker EDF required? ☐ Yes X No
LOCUS EDD required? ☐ Yes X No
Report Results to: ☐ RL X MDL
Report soil results to: ☐ wet weight (total) ☐ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

COC Number:

Page 1 of 1

SDG number: 1066144

**PROJECT INFORMATION**

**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

ANALYSIS REQUESTED

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | pH (SM 4500HB) | Total Suspended Solids (SM 2540D) | Oil & Grease (EPA 1664A SGT-HEM) | Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS) CN | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|---|---|---|
| | TS1-E-190130 | 1/30/2019 | 800 | W | 5 | X | X | X | X | -01 |
| | TS2-E-190130 | 1/30/2019 | 835 | W | 5 | X | X | X | X | 02 |
| | TS3-E-190130 | 1/30/2019 | 905 | W | 5 | X | X | X | X | 03 |
| | TS4-E-190130 | 1/30/2019 | 935 | W | 5 | X | X | X | X | 04 |
| | TSX-E-190130 | 1/30/2019 | 905 | W | 8 9 BF | X | X | X | X | Perform MS/MSD using additional volume provided 05 |
| | | | | | Field Filtered (X): | | | | | |
| | Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | 1 | 1 | 1, 3 | 1, 4 | 1, 4 |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

RAD SCREEN: <0.5 mR/hr

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | CDIM | 1/31/19 1233 | | | |
| | | | | | |
| | | | [signature] | PACE | 2/1/19 0845 |

x = Samples released to a secured, locked area. • = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 805 256 9230 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 1/31/19 1015 |

0.4±0 A3 BF

FedEx: 4824 2994 7609 { 7594 } 7583 Rec: 28

NCF

## Pace Analytical National Center for Testing & Innovation
## Cooler Receipt Form

| | | |
|---|---|---|
| Client: COIENGSFCA | SDG#: | 1066144 |
| Cooler Received/Opened On: 02/ 1 /19 | Temperature: | 0.4 |
| Received By: Brock Fariss | | |
| Signature: BK Fariss | | |

| Receipt Check List | NP | Yes | No |
|---|---|---|---|
| COC Seal Present / Intact? | ✓ | | |
| COC Signed / Accurate? | | ✓ | |
| Bottles arrive intact? | | ✓ | |
| Correct bottles used? | | ✓ | |
| Sufficient volume sent? | | ✓ | |
| If Applicable | | | |
| VOA Zero headspace? | | | |
| Preservation Correct / Checked? | | ✓ | |

**Andy Vann**

Pace Analytical®
National Center for Testing & Innovation

| Login #:L1066144 | Client:CDIENGSFCA | Date:02/1 | Evaluated by:Kelsey S |
|---|---|---|---|

**Non-Conformance (check applicable items)**

| | Sample Integrity | | Chain of Custody Clarification | | |
|---|---|---|---|---|---|
| | Parameter(s) past holding time | x | Login Clarification Needed | | **If Broken Container:** |
| | Temperature not in range | | Chain of custody is incomplete | | Insufficient packing material around container |
| | Improper container type | | Please specify Metals requested. | | Insufficient packing material inside cooler |
| | pH not in range. | | Please specify TCLP requested. | | Improper handling by carrier (FedEx / UPS / Couri |
| | Insufficient sample volume. | | Received additional samples not listed on coc. | | Sample was frozen |
| | Sample is biphasic. | | Sample ids on containers do not match ids on coc | | Container lid not intact |
| | Vials received with headspace. | | Trip Blank not received. | | **If no Chain of Custody:** |
| | Broken container | | Client did not "X" analysis. | | Received by: |
| | Broken container: | | Chain of Custody is missing | | Date/Time: |
| | Sufficient sample remains | | | | Temp./Cont. Rec./pH: |
| | | | | | Carrier: |
| | | | | | Tracking# |

**Login Comments:TS4-E-190131 received with a time of 0940 on containers but COC states 0935. Currently logged per COC.**

| Client informed by: | | Call | | Email X | | Voice Mail | | Date:02/04/19 | Time:1145 |
|---|---|---|---|---|---|---|---|---|---|
| TSR Initials:bjf | Client Contact: Bryan Starks | | | | | | | | |

**Login Instructions:**

Times listed on containers are correct.

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

February 08, 2019

## CDIM Engineering - San Francisco, CA

| | |
|---|---|
| Sample Delivery Group: | L1066157 |
| Samples Received: | 02/01/2019 |
| Project Number: | 101-003 TASK 1 |
| Description: | LRTC 2018-2019 Industrial Stormwater |
| | |
| Report To: | Mary Cunningham<br>45 Polk Street<br>3rd Floor<br>San Francisco, CA 94102 |

Entire Report Reviewed By:

Brian Ford
Project Manager



# TABLE OF CONTENTS

## TS1-I-190131 L1066157-01 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/31/19 07:55 | 02/01/19 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1231948 | 1 | 02/05/19 12:51 | 02/05/19 13:32 | AEC |
| Wet Chemistry by Method 1664A | WG1233342 | 1 | 02/06/19 08:27 | 02/06/19 16:51 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1231870 | 1 | 02/03/19 09:22 | 02/03/19 09:22 | TH |
| Metals (ICPMS) by Method 200.8 | WG1231915 | 1 | 02/04/19 15:07 | 02/05/19 15:01 | JPD |

## TS2-I-190131 L1066157-02 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/31/19 08:25 | 02/01/19 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1231948 | 1 | 02/05/19 12:51 | 02/05/19 13:32 | AEC |
| Wet Chemistry by Method 1664A | WG1233342 | 1 | 02/06/19 08:27 | 02/06/19 16:51 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1231870 | 1 | 02/03/19 09:22 | 02/03/19 09:22 | TH |
| Metals (ICPMS) by Method 200.8 | WG1231915 | 1 | 02/04/19 15:07 | 02/05/19 15:05 | JPD |

## TS3-I-190131 L1066157-03 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/31/19 09:00 | 02/01/19 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1231948 | 1 | 02/05/19 12:51 | 02/05/19 13:32 | AEC |
| Wet Chemistry by Method 1664A | WG1233342 | 1 | 02/06/19 08:27 | 02/06/19 16:51 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1231870 | 1 | 02/03/19 09:22 | 02/03/19 09:22 | TH |
| Metals (ICPMS) by Method 200.8 | WG1231915 | 1 | 02/04/19 15:07 | 02/05/19 15:10 | JPD |

## TS4-I-190131 L1066157-04 WW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| | 01/31/19 09:35 | 02/01/19 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 D-2011 | WG1231948 | 1 | 02/05/19 12:51 | 02/05/19 13:32 | AEC |
| Wet Chemistry by Method 1664A | WG1233342 | 1 | 02/06/19 08:27 | 02/06/19 16:51 | DAD |
| Wet Chemistry by Method 4500H+ B-2011 | WG1231870 | 1 | 02/03/19 09:22 | 02/03/19 09:22 | TH |
| Metals (ICPMS) by Method 200.8 | WG1231915 | 1 | 02/04/19 15:07 | 02/05/19 15:15 | JPD |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Project Manager

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 122000 | | 3500 | 25000 | 1 | 02/05/2019 13:32 | WG1231948 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 980 | J | 884 | 6100 | 1 | 02/06/2019 16:51 | WG1233342 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 8.42 | T8 | 1 | 02/03/2019 09:22 | WG1231870 |

**Sample Narrative:**

L1066157-01 WG1231870: 8.42 at 17.3C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 2700 | | 20.0 | 100 | 1 | 02/05/2019 15:01 | WG1231915 |
| Iron | 9250 | | 15.0 | 100 | 1 | 02/05/2019 15:01 | WG1231915 |
| Lead | 203 | | 0.260 | 1.00 | 1 | 02/05/2019 15:01 | WG1231915 |
| Zinc | 932 | | 1.91 | 10.0 | 1 | 02/05/2019 15:01 | WG1231915 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 55000 | | 1750 | 12500 | 1 | 02/05/2019 13:32 | WG1231948 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 806 | 5560 | 1 | 02/06/2019 16:51 | WG1233342 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.65 | T8 | 1 | 02/03/2019 09:22 | WG1231870 |

**Sample Narrative:**

L1066157-02 WG1231870: 7.65 at 17.6C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 318 | | 20.0 | 100 | 1 | 02/05/2019 15:05 | WG1231915 |
| Iron | 969 | | 15.0 | 100 | 1 | 02/05/2019 15:05 | WG1231915 |
| Lead | 8.89 | | 0.260 | 1.00 | 1 | 02/05/2019 15:05 | WG1231915 |
| Zinc | 87.1 | | 1.91 | 10.0 | 1 | 02/05/2019 15:05 | WG1231915 |

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 58000 | | 501 | 3580 | 1 | 02/05/2019 13:32 | WG1231948 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 6320 | | 833 | 5750 | 1 | 02/06/2019 16:51 | WG1233342 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.59 | T8 | 1 | 02/03/2019 09:22 | WG1231870 |

**Sample Narrative:**

L1066157-03 WG1231870: 7.59 at 17.6C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 1130 | | 20.0 | 100 | 1 | 02/05/2019 15:10 | WG1231915 |
| Iron | 2780 | | 15.0 | 100 | 1 | 02/05/2019 15:10 | WG1231915 |
| Lead | 98.3 | | 0.260 | 1.00 | 1 | 02/05/2019 15:10 | WG1231915 |
| Zinc | 175 | | 1.91 | 10.0 | 1 | 02/05/2019 15:10 | WG1231915 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Gravimetric Analysis by Method 2540 D-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Suspended Solids | 4880 | | 438 | 3130 | 1 | 02/05/2019 13:32 | WG1231948 |

## Wet Chemistry by Method 1664A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | U | | 771 | 5320 | 1 | 02/06/2019 16:51 | WG1233342 |

## Wet Chemistry by Method 4500H+ B-2011

| Analyte | Result su | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| pH | 7.26 | T8 | 1 | 02/03/2019 09:22 | WG1231870 |

**Sample Narrative:**

L1066157-04 WG1231870: 7.26 at 17.9C

## Metals (ICPMS) by Method 200.8

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Aluminum | 74.3 | J | 20.0 | 100 | 1 | 02/05/2019 15:15 | WG1231915 |
| Iron | 767 | | 15.0 | 100 | 1 | 02/05/2019 15:15 | WG1231915 |
| Lead | 2.72 | | 0.260 | 1.00 | 1 | 02/05/2019 15:15 | WG1231915 |
| Zinc | 121 | | 1.91 | 10.0 | 1 | 02/05/2019 15:15 | WG1231915 |

## Method Blank (MB)

(MB) R3381465-1 02/05/19 13:32

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Suspended Solids | U | | 350 | 2500 |

## L1066021-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1066021-01 02/05/19 13:32 • (DUP) R3381465-3 02/05/19 13:32

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 87000 | 84000 | 1 | 3.51 | | 5 |

## L1066157-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1066157-01 02/05/19 13:32 • (DUP) R3381465-4 02/05/19 13:32

| Analyte | Original Result ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Suspended Solids | 122000 | 117000 | 1 | 4.18 | | 5 |

## Laboratory Control Sample (LCS)

(LCS) R3381465-2 02/05/19 13:32

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Suspended Solids | 773000 | 856000 | 111 | 85.0-115 | |

## Method Blank (MB)

(MB) R3381744-1 02/06/19 16:51

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| TPH - Oil & Grease | U | | 725 | 5000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3381744-2 02/06/19 16:51 • (LCSD) R3381744-3 02/06/19 16:51

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 20000 | 19100 | 20000 | 95.5 | 100 | 64.0-132 | | | 4.60 | 34 |

## L1066144-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1066144-05 02/06/19 16:51 • (MS) R3381744-4 02/06/19 16:51 • (MSD) R3381744-5 02/06/19 16:51

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPH - Oil & Grease | 20000 | U | 18500 | 18600 | 92.6 | 93.1 | 1 | 64.0-132 | | | 0.539 | 34 |

## L1065989-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1065989-04 02/03/19 09:22 • (DUP) R3380816-2 02/03/19 09:22

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 6.70 | 6.71 | 1 | 0.149 | | 1 |

Sample Narrative:

OS: 6.7 at 17.4C

DUP: 6.71 at 17.3C

## L1066202-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1066202-01 02/03/19 09:22 • (DUP) R3380816-3 02/03/19 09:22

| Analyte | Original Result su | DUP Result su | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| pH | 7.34 | 7.36 | 1 | 0.272 | | 1 |

Sample Narrative:

OS: 7.34 at 16.5C

DUP: 7.36 at 16.5C

## Laboratory Control Sample (LCS)

(LCS) R3380816-1 02/03/19 09:22

| Analyte | Spike Amount su | LCS Result su | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| pH | 10.0 | 9.98 | 99.8 | 99.0-101 | |

Sample Narrative:

LCS: 9.98 at 19.1C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) R3381258-1 02/04/19 23:11

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Aluminum | U | | 20.0 | 100 |
| Iron | U | | 15.0 | 100 |
| Lead | U | | 0.260 | 1.00 |
| Zinc | U | | 1.91 | 10.0 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3381258-2 02/04/19 23:15 • (LCSD) R3381258-3 02/04/19 23:20

| Analyte | Spike Amount ug/l | LCS Result ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 4740 | 4770 | 94.8 | 95.4 | 85.0-115 | | | 0.591 | 20 |
| Iron | 5000 | 4740 | 4760 | 94.7 | 95.1 | 85.0-115 | | | 0.386 | 20 |
| Lead | 50.0 | 47.2 | 48.4 | 94.4 | 96.8 | 85.0-115 | | | 2.55 | 20 |
| Zinc | 50.0 | 49.8 | 50.6 | 99.6 | 101 | 85.0-115 | | | 1.62 | 20 |

## L1066091-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1066091-01 02/04/19 23:24 • (MS) R3381258-5 02/04/19 23:33 • (MSD) R3381258-6 02/04/19 23:38

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | 354 | 5250 | 5260 | 97.9 | 98.1 | 1 | 70.0-130 | | | 0.207 | 20 |
| Iron | 5000 | 500 | 5270 | 5290 | 95.4 | 95.9 | 1 | 70.0-130 | | | 0.431 | 20 |
| Lead | 50.0 | ND | 48.6 | 49.3 | 95.7 | 97.0 | 1 | 70.0-130 | | | 1.39 | 20 |
| Zinc | 50.0 | 11.6 | 60.5 | 62.3 | 98.0 | 102 | 1 | 70.0-130 | | | 2.92 | 20 |

## L1066144-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1066144-05 02/04/19 23:42 • (MS) R3381258-7 02/04/19 23:47 • (MSD) R3381258-8 02/04/19 23:52

| Analyte | Spike Amount ug/l | Original Result ug/l | MS Result ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5000 | U | 4820 | 4980 | 96.5 | 99.6 | 1 | 70.0-130 | | | 3.18 | 20 |
| Iron | 5000 | 75.7 | 4790 | 5010 | 94.3 | 98.6 | 1 | 70.0-130 | | | 4.41 | 20 |
| Lead | 50.0 | 2.95 | 51.6 | 54.3 | 97.4 | 103 | 1 | 70.0-130 | | | 5.02 | 20 |
| Zinc | 50.0 | 68.8 | 117 | 119 | 96.9 | 100 | 1 | 70.0-130 | | | 1.30 | 20 |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| ND | Not detected at the Reporting Limit (or MDL where applicable). |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| T8 | Sample(s) received past/too close to holding time expiration. |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO00356 |
| Kentucky [1 6] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

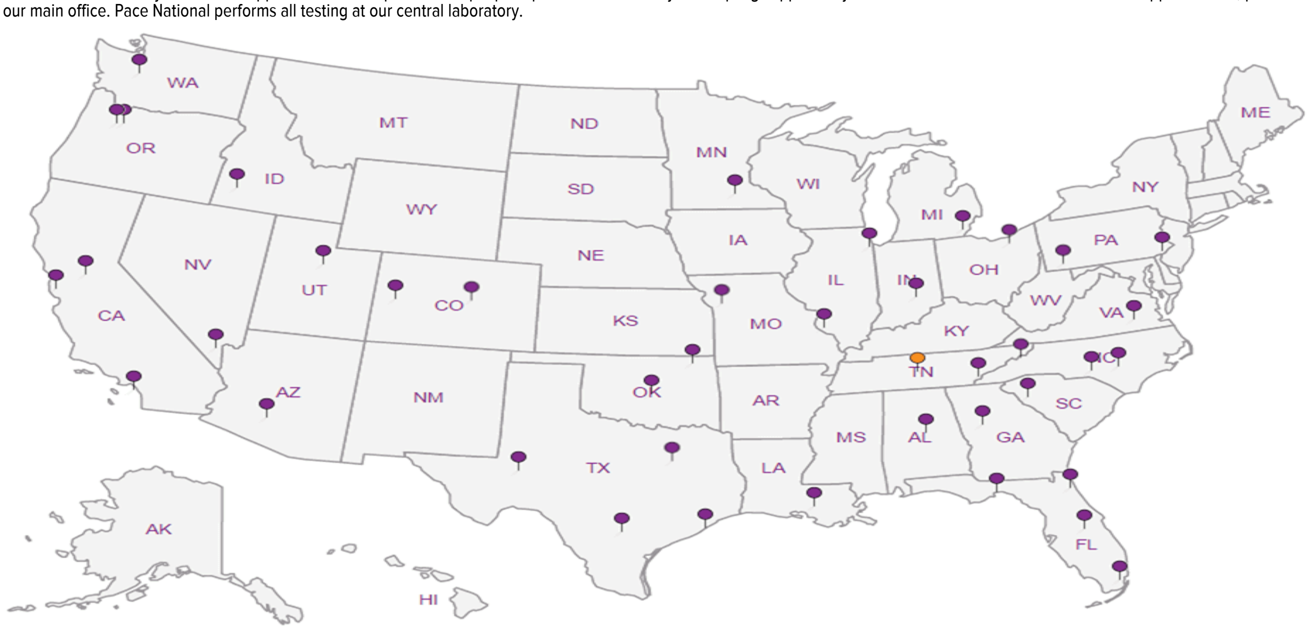
## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

H219

**LABORATORY:**
ESC Laboratory
12065 Lebanon Road, Mt. Juliet, TN 37122
(615) 773-9772
Brian Ford

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**INSTRUCTIONS FOR LAB PERSONNEL:**
Please send analytic results, electronic deliverables and the original chain-of-custody form to:
bas@cdimengineering.com, mec@cdimengineering.com
sab@cdimengineering.com

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

Analysis Turnaround Time X Standard ☐ Other
GeoTracker EDF required? ☐ Yes X No
LOCUS EDD required? ☐ Yes X No
Report Results to ☐ RL X MDL
Report soil results to: ☐ wet weight (total) ☐ dry weight

Specify analytic/prep method and detection limit in report.
Notify us of any anomalous peaks in GC or other scans.
Call immediately with any questions or problems.

**COC Number:**

Page 1 of 1

**SDG number:** 1066157

**PROJECT INFORMATION**
**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

**ANALYSIS REQUESTED** L2

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | pH (SM 4500HB) | Total Suspended Solids (SM 2540D) | Oil & Grease (EPA 1664A SGT-HEM) | Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|---|---|---|
| | TS1-I-190130 | 1/30/2019 | 755 | W | 5 | X | X | X | X | -01 |
| | TS2-I-190130 | 1/30/2019 | 825 | W | 5 | X | X | X | X | -02 |
| | TS3-I-190130 | 1/30/2019 | 900 | W | 5 | X | X | X | X | 03 |
| | TS4-I-190130 | 1/30/2019 | 930 | W | 5 | X | X | X | X | 04 |
| | | | | | **Field Filtered (X):** | | | | | |
| | Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | 1 | 1 | 1, 3 | 1, 4 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

RAD SCREEN: <0.5 mR/hr

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | CDIM | 1/31/19 1238 | | | |
| | | | | | |
| | | | [signature] | PACE | 2/1/19 0845 |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

0.4±0 AJ BF

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 608 256 9230 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 1/31/19 1015 |

FedEx: 4624 2994 7609 } 7594 } 7583 Rec=20

# Pace Analytical National Center for Testing & Innovation
## Cooler Receipt Form

| | | | |
|---|---|---|---|
| Client: CDLENGSECA | SDG#: | 1066157 | |
| Cooler Received/Opened On: 02/ 1 /19 | Temperature: | 0.4 | |
| Received By: Brock Fariss | | | |
| Signature: BK Fariss | | | |

| Receipt Check List | NP | Yes | No |
|---|---|---|---|
| COC Seal Present / Intact? | ✓ | | |
| COC Signed / Accurate? | | ✓ | |
| Bottles arrive intact? | | ✓ | |
| Correct bottles used? | | ✓ | |
| Sufficient volume sent? | | ✓ | |
| If Applicable | | | |
| VOA Zero headspace? | | | |
| Preservation Correct / Checked? | | | |

Pace Analytical®
National Center for Testing & Innovation

| Login #:L1066157 | Client:CDIENGSFCA | Date:02/1 | Evaluated by:Kelsey S |
|---|---|---|---|

**Non-Conformance (check applicable items)**

| | Sample Integrity | | Chain of Custody Clarification | | |
|---|---|---|---|---|---|
| | Parameter(s) past holding time | x | Login Clarification Needed | | **If Broken Container:** |
| | Temperature not in range | | Chain of custody is incomplete | | Insufficient packing material around container |
| | Improper container type | | Please specify Metals requested. | | Insufficient packing material inside cooler |
| | pH not in range. | | Please specify TCLP requested. | | Improper handling by carrier (FedEx / UPS / Couri |
| | Insufficient sample volume. | | Received additional samples not listed on coc. | | Sample was frozen |
| | Sample is biphasic. | | Sample ids on containers do not match ids on coc | | Container lid not intact |
| | Vials received with headspace. | | Trip Blank not received. | | **If no Chain of Custody:** |
| | Broken container | | Client did not "X" analysis. | | Received by: |
| | Broken container: | | Chain of Custody is missing | | Date/Time: |
| | Sufficient sample remains | | | | Temp./Cont. Rec./pH: |
| | | | | | Carrier: |
| | | | | | Tracking# |

**Login Comments:TS4-i-190131 received with a time of 0935 on containers but COC states 0930. Currently logged per COC.**

| Client informed by: | | Call | | Email X | | Voice Mail | | Date:02/04/19 | Time:1145 |
|---|---|---|---|---|---|---|---|---|---|
| TSR Initials:bjf | Client Contact: Bryan Starks | | | | | | | | |

**Login Instructions:**

Times listed on containers are correct.

February 22, 2019

**Vista Work Order No. 1900217**

Mr. Scott Bourne
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, CA 94102

Dear Mr. Bourne,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on February 01, 2019 under your Project Name '101-003, Task 1'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

**Vista Work Order No. 1900217**
**Case Narrative**

**Sample Condition on Receipt:**

One water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

**Analytical Notes:**

**EPA Method 1699**

The sample was extracted and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

Labeled standard recoveries for all QC and field samples were within method acceptance criteria.

TABLE OF CONTENTS

# Sample Inventory Report

| Vista Sample ID | Client Sample ID | Sampled | Received | Components/Containers |
|---|---|---|---|---|
| 1900217-01 | TS2-E-190131 | 31-Jan-19 08:35 | 01-Feb-19 07:50 | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |

Vista Project: 1900217

Client Project: 101-003, Task 1

## ANALYTICAL RESULTS

| Sample ID: **Method Blank** | | EPA Method 1699 |
| --- | --- | --- |
| Matrix: Aqueous<br>Sample Size: 1.00 L | QC Batch: B9B0017<br>Date Extracted: 04-Feb-2019 8:41 | Lab Sample: B9B0017-BLK1<br>Date Analyzed: 05-Feb-19 16:55 Column: ZB-50 |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
| --- | --- | --- | --- | --- |
| Hexachlorobenzene | 4.77 | | | J |
| alpha-BHC | ND | 3.61 | | |
| Lindane (gamma-BHC) | ND | 4.38 | | |
| beta-BHC | ND | 4.69 | | |
| delta-BHC | ND | 3.53 | | |
| Heptachlor | ND | 3.37 | | |
| Aldrin | ND | 3.69 | | |
| Oxychlordane | ND | 14.1 | | |
| cis-Heptachlor Epoxide | ND | 9.00 | | |
| trans-Heptachlor Epoxide | ND | 23.3 | | |
| trans-Chlordane (gamma) | ND | 12.7 | | |
| trans-Nonachlor | ND | 12.1 | | |
| cis-Chlordane (alpha) | ND | 12.2 | | |
| Endosulfan I (alpha) | ND | 16.0 | | |
| 2,4'-DDE | ND | 3.22 | | |
| 4,4'-DDE | ND | 3.60 | | |
| Dieldrin | ND | 2.53 | | |
| Endrin | ND | 3.53 | | |
| cis-Nonachlor | ND | 5.23 | | |
| Endosulfan II (beta) | ND | 7.06 | | |
| 2,4'-DDD | ND | 6.02 | | |
| 2,4'-DDT | ND | 11.1 | | |
| 4,4'-DDD | ND | 6.63 | | |
| 4,4'-DDT | ND | 10.5 | | |
| Endosulfan Sulfate | ND | 10.6 | | |
| 4,4'-Methoxychlor | ND | 2.79 | | |
| Mirex | ND | 2.85 | | |
| Endrin Aldehyde | ND | 5.09 | | |
| Endrin Ketone | ND | 7.35 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
| --- | --- | --- | --- | --- |
| IS | 13C6-Hexachlorobenzene | 61.4 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 79.8 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 86.3 | 11 - 120 | |
| IS | 13C6-beta-BHC | 83.2 | 32 - 130 | |
| IS | 13C6-delta-BHC | 86.3 | 36 - 137 | |
| IS | 13C10-Heptachlor | 83.7 | 5 - 120 | |
| IS | 13C12-Aldrin | 82.2 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 94.1 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 96.0 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 89.2 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 89.6 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 90.5 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 108 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 113 | 47 - 160 | |
| IS | 13C12-Dieldrin | 82.0 | 40 - 151 | |
| IS | 13C12-Endrin | 92.8 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 82.1 | 36 - 139 | |
| IS | 13C9-Endosulfan II (beta) | 87.0 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 93.5 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 91.7 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 90.3 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 96.2 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 93.8 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 75.8 | 5 - 120 | |
| IS | 13C10-Mirex | 79.3 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 54.4 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 72.8 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

**Sample ID: OPR** **EPA Method 1699**

| | | | |
|---|---|---|---|
| Matrix: Aqueous | QC Batch: B9B0017 | Lab Sample: B9B0017-BS1 | |
| Sample Size: 1.00 L | Date Extracted: 04-Feb-2019 8:41 | Date Analyzed: 05-Feb-19 14:27 | Column: ZB-50 |

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits |
|---|---|---|---|---|
| Hexachlorobenzene | 976 | 1000 | 97.6 | 50 - 120 |
| alpha-BHC | 984 | 1000 | 98.4 | 50 - 120 |
| Lindane (gamma-BHC) | 964 | 1000 | 96.4 | 50 - 120 |
| beta-BHC | 996 | 1000 | 99.6 | 50 - 120 |
| delta-BHC | 1000 | 1000 | 100 | 50 - 120 |
| Heptachlor | 1020 | 1000 | 102 | 50 - 120 |
| Aldrin | 963 | 1000 | 96.3 | 50 - 120 |
| Oxychlordane | 988 | 1000 | 98.8 | 50 - 120 |
| cis-Heptachlor Epoxide | 1020 | 1000 | 102 | 50 - 120 |
| trans-Heptachlor Epoxide | 1050 | 1000 | 105 | 50 - 120 |
| trans-Chlordane (gamma) | 1010 | 1000 | 101 | 50 - 120 |
| trans-Nonachlor | 954 | 1000 | 95.4 | 50 - 120 |
| cis-Chlordane (alpha) | 1060 | 1000 | 106 | 50 - 120 |
| Endosulfan I (alpha) | 946 | 1000 | 94.6 | 50 - 120 |
| 2,4'-DDE | 975 | 1000 | 97.5 | 24 - 123 |
| 4,4'-DDE | 995 | 1000 | 99.5 | 50 - 120 |
| Dieldrin | 1020 | 1000 | 102 | 50 - 120 |
| Endrin | 1060 | 1000 | 106 | 50 - 120 |
| cis-Nonachlor | 1070 | 1000 | 107 | 50 - 120 |
| Endosulfan II (beta) | 959 | 1000 | 95.9 | 5 - 200 |
| 2,4'-DDD | 929 | 1000 | 92.9 | 50 - 120 |
| 2,4'-DDT | 1010 | 1000 | 101 | 50 - 120 |
| 4,4'-DDD | 975 | 1000 | 97.5 | 42 - 120 |
| 4,4'-DDT | 924 | 1000 | 92.4 | 50 - 120 |
| Endosulfan Sulfate | 947 | 1000 | 94.7 | 50 - 120 |
| 4,4'-Methoxychlor | 952 | 1000 | 95.2 | 50 - 120 |
| Mirex | 993 | 1000 | 99.3 | 50 - 120 |
| Endrin Aldehyde | 1040 | 1000 | 104 | 50 - 134 |
| Endrin Ketone | 933 | 1000 | 93.3 | 50 - 134 |

| | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 62.0 | 5 - 120 |
| IS | 13C6-alpha-BHC | 78.3 | 17 - 141 |
| IS | 13C6-Lindane (gamma-BHC) | 86.3 | 5 - 124 |
| IS | 13C6-beta-BHC | 83.8 | 17 - 141 |
| IS | 13C6-delta-BHC | 86.3 | 16 - 150 |
| IS | 13C10-Heptachlor | 81.5 | 5 - 128 |
| IS | 13C12-Aldrin | 82.1 | 5 - 126 |
| IS | 13C10-Oxychlordane | 99.7 | 5 - 144 |
| IS | 13C10-cis-Heptachlor Epoxide | 98.5 | 8 - 146 |
| IS | 13C10-trans-Chlordane (gamma) | 95.0 | 15 - 144 |
| IS | 13C10-trans-Nonachlor | 93.7 | 13 - 149 |
| IS | 13C9-Endosulfan I (alpha) | 106 | 5 - 144 |
| IS | 13C12-2,4'-DDE | 99.8 | 26 - 169 |
| IS | 13C12-4,4'-DDE | 103 | 26 - 169 |
| IS | 13C12-Dieldrin | 87.7 | 19 - 161 |
| IS | 13C12-Endrin | 90.7 | 20 - 157 |
| IS | 13C10-cis-Nonachlor | 86.3 | 17 - 154 |
| IS | 13C9-Endosulfan II (beta) | 78.4 | 5 - 120 |
| IS | 13C12-2,4'-DDD | 89.3 | 14 - 200 |
| IS | 13C12-2,4'-DDT | 85.2 | 14 - 200 |
| IS | 13C12-4,4'-DDD | 87.2 | 14 - 200 |
| IS | 13C12-4,4'-DDT | 93.6 | 13 - 200 |
| IS | 13C9-Endosulfan Sulfate | 94.8 | 5 - 144 |
| IS | 13C12-Methoxychlor | 77.8 | 8 - 200 |
| IS | 13C10-Mirex | 82.9 | 5 - 138 |
| IS | 13C12-Endrin Aldehyde | 53.6 | 5 - 144 |
| IS | 13C12-Endrin Ketone | 71.7 | 5 - 144 |

LCL-UCL - Lower control limit - upper control limit

**Sample ID: TS2-E-190131** **EPA Method 1699**

| Client Data | | Sample Data | | Laboratory Data | | | |
|---|---|---|---|---|---|---|---|
| Name: | CDIM Engineering | Matrix: | Water | Lab Sample: | 1900217-01 | Date Received: | 01-Feb-2019 7:50 |
| Project: | 101-003, Task 1 | Sample Size: | 1.01 L | QC Batch: | B9B0017 | Date Extracted: | 04-Feb-2019 8:41 |
| Date Collected: | 31-Jan-2019 8:35 | | | Date Analyzed: | 05-Feb-19 19:23 | Column: ZB-50 | |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers | | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|
| Hexachlorobenzene | 25.1 | | | J, B | IS | 13C6-Hexachlorobenzene | 69.1 | 5 - 120 | |
| alpha-BHC | 19.7 | | | J | IS | 13C6-alpha-BHC | 77.9 | 32 - 130 | |
| Lindane (gamma-BHC) | 11.9 | | | J | IS | 13C6-Lindane (gamma-BHC) | 83.1 | 11 - 120 | |
| beta-BHC | 49.2 | | | | IS | 13C6-beta-BHC | 84.7 | 32 - 130 | |
| delta-BHC | ND | 3.33 | | | IS | 13C6-delta-BHC | 87.7 | 36 - 137 | |
| Heptachlor | ND | 9.38 | | | IS | 13C10-Heptachlor | 82.5 | 5 - 120 | |
| Aldrin | ND | 7.88 | | | IS | 13C12-Aldrin | 77.4 | 5 - 120 | |
| Oxychlordane | ND | 26.2 | | | IS | 13C10-Oxychlordane | 93.6 | 23 - 135 | |
| cis-Heptachlor Epoxide | 102 | | | | IS | 13C10-cis-Heptachlor Epoxide | 95.4 | 27 - 137 | |
| trans-Heptachlor Epoxide | 1920 | | | | IS | 13C10-trans-Chlordane (gamma) | 91.5 | 21 - 132 | |
| trans-Chlordane (gamma) | 82.4 | | | | IS | 13C10-trans-Nonachlor | 93.9 | 14 - 136 | |
| trans-Nonachlor | ND | | 27.3 | | IS | 13C9-Endosulfan I (alpha) | 97.7 | 15 - 148 | |
| cis-Chlordane (alpha) | 148 | | | | IS | 13C12-2,4'-DDE | 107 | 47 - 160 | |
| Endosulfan I (alpha) | ND | 27.9 | | | IS | 13C12-4,4'-DDE | 111 | 47 - 160 | |
| 2,4'-DDE | 7.56 | | | J | IS | 13C12-Dieldrin | 80.0 | 40 - 151 | |
| 4,4'-DDE | 142 | | | | IS | 13C12-Endrin | 92.4 | 35 - 155 | |
| Dieldrin | 1060 | | | | IS | 13C10-cis-Nonachlor | 81.4 | 36 - 139 | |
| Endrin | 279 | | | | IS | 13C9-Endosulfan II (beta) | 79.3 | 5 - 122 | |
| cis-Nonachlor | ND | 13.0 | | | IS | 13C12-2,4'-DDD | 95.8 | 5 - 199 | |
| Endosulfan II (beta) | ND | 18.3 | | | IS | 13C12-2,4'-DDT | 93.6 | 5 - 199 | |
| 2,4'-DDD | 83.1 | | | | IS | 13C12-4,4'-DDD | 93.4 | 5 - 120 | |
| 2,4'-DDT | 61.8 | | | | IS | 13C12-4,4'-DDT | 98.3 | 5 - 120 | |
| 4,4'-DDD | 112 | | | | IS | 13C9-Endosulfan Sulfate | 88.3 | 15 - 148 | |
| 4,4'-DDT | 182 | | | | IS | 13C12-Methoxychlor | 76.4 | 5 - 120 | |
| Endosulfan Sulfate | ND | 31.2 | | | IS | 13C10-Mirex | 77.8 | 5 - 120 | |
| 4,4'-Methoxychlor | ND | 5.17 | | | IS | 13C12-Endrin Aldehyde | 49.8 | 15 - 148 | |
| Mirex | ND | 6.86 | | | IS | 13C12-Endrin Ketone | 67.8 | 15 - 148 | |
| Endrin Aldehyde | ND | 14.4 | | | | | | | |
| Endrin Ketone | 629 | | | | | | | | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

# DATA QUALIFIERS & ABBREVIATIONS

| | |
|---|---|
| B | This compound was also detected in the method blank |
| Conc. | Concentration |
| D | Dilution |
| DL | Detection limit |
| E | The associated compound concentration exceeded the calibration range of the instrument |
| H | Recovery and/or RPD was outside laboratory acceptance limits |
| I | Chemical Interference |
| J | The amount detected is below the Reporting Limit/LOQ |
| LOD | Limits of Detection |
| LOQ | Limits of Quantitation |
| M | Estimated Maximum Possible Concentration (CA Region 2 projects only) |
| NA | Not applicable |
| ND | Not Detected |
| P | The reported concentration may include contribution from chlorinated diphenyl ether(s). |
| Q | Ion ratio outside of 70-130% of Standard Ratio. |
| TEQ | Toxic Equivalency |
| U | Not Detected (specific projects only) |
| * | See Cover Letter |

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

## Vista Analytical Laboratory Certifications

| **Accrediting Authority** | **Certificate Number** |
|---|---|
| Alaska Department of Environmental Conservation | 17-013 |
| Arkansas Department of Environmental Quality | 19-013-0 |
| California Department of Health – ELAP | 2892 |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005 | 3091.01 |
| Florida Department of Health | E87777 |
| Hawaii Department of Health | N/A |
| Louisiana Department of Environmental Quality | 01977 |
| Maine Department of Health | 2018017 |
| Michigan Department of Environmental Quality | 9932 |
| Minnesota Department of Health | 1521520 |
| New Hampshire Environmental Accreditation Program | 207718 |
| New Jersey Department of Environmental Protection | CA003 |
| New York Department of Health | 11411 |
| Oregon Laboratory Accreditation Program | 4042-010 |
| Pennsylvania Department of Environmental Protection | 015 |
| Texas Commission on Environmental Quality | T104704189-19-10 |
| Virginia Department of General Services | 9618 |
| Washington Department of Ecology | C584-18 |
| Wisconsin Department of Natural Resources | 998036160 |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

| MATRIX: Air | |
|---|---|
| **Description of Test** | **Method** |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23 |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water | |
|---|---|
| **Description of Test** | **Method** |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS | EPA 522 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Dioxin by GC/HRMS | EPA 613 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids | |
|---|---|
| **Description of Test** | **Method** |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613 |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

1900217 1.0°C

| LABORATORY: | INSTRUCTIONS FOR LAB PERSONNEL: | |
|---|---|---|
| Vista Analytical<br>1104 Windfield Way, El Dorado Hills CA 95762<br>(916) 673-1520<br>Karen Volpendesta | Please send analytic results, electronic deliverables and the original chain-of-custody form to:<br>bas@cdimengineering.com, mec@cdimengineering.com<br>sab@cdimengineering.com | Analysis Turnaroud Time X Standard ☐ Other<br>GeoTracker EDF required? ☐ Yes X No<br>LOCUS EDD required? ☐ Yes X No<br>Report Results to: ☐ RL X MDL<br>Report soil results to: ☐ wet weight (total) ☐ dry weight<br>Specify analytic/prep method and detection limit in report.<br>Notify us of any anomalous peaks in GC or other scans.<br>Call immediately with any questions or problems. |

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**ANALYSIS REQUESTED**

**COC Number:**

Page 1 of 1

**SDG number:**

**PROJECT INFORMATION**

**Job Name:** LRTC 2018-2019 Industrial Stormwater

**Job #:** 101-003, Task 1

**Address:** 402 Wright Avenue, Richmond CA 94804

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | Pesticides (EPA 1699) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|
| | TS2-E-190130 | 1/30/2019 | 835 | W | 3 | X | Composite |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | **Field Filtered (X):** | | |
| Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | | 1 | |

**Special Instructions/QC Requirements & Comments:** Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| [signature] ☐ | CDIM | 1230 1/31/19 | Kim Ellis ○ | VAL | 2/1/19 0750 |
| ☐ | | | ○ | | |
| ☐ | | | ○ | | |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| | | | |
|---|---|---|---|
| SAMPLERS NAME | Bryan Starks | MOBILE # | 805 256 9230 |
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 1/31/19 1015 |

Vista
Analytical Laboratory

# Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1900217

TAT std

| | | | |
|---|---|---|---|
| **Samples Arrival:** | **Date/Time** 2/1/19 0750 | **Initials:** KE | **Location:** WR-2<br>**Shelf/Rack:** NA |
| **Logged In:** | **Date/Time** 2/1/19 0822 | **Initials:** KE | **Location:** WR-2<br>**Shelf/Rack:** B1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Delivered By:** | FedEx | UPS | On Trac | GSO | DHL | Hand Delivered | Other |

| | | | | |
|---|---|---|---|---|
| **Preservation:** | Ice | Blue Ice | Dry Ice | None |

| | | | |
|---|---|---|---|
| **Temp °C:** 1.1 **(uncorrected)** | **Probe used: Y / N** | **Thermometer ID:** IR4 |
| **Temp °C:** 1.0 **(corrected)** | | |

| | YES | NO | NA |
|---|---|---|---|
| Adequate Sample Volume Received? | ✓ | | |
| Holding Time Acceptable? | ✓ | | |
| Shipping Container(s) Intact? | ✓ | | |
| Shipping Custody Seals Intact? | | | ✓ |
| Shipping Documentation Present? | ✓ | | |
| Airbill F.O. Trk # 7852 5050 5357 | ✓ | | |
| Sample Container Intact? | ✓ | | |
| Sample Custody Seals Intact? | | | ✓ |
| Chain of Custody / Sample Documentation Present? | ✓ | | |
| COC Anomaly/Sample Acceptance Form completed? | | ✓ | ✓ |

| | | | | | | |
|---|---|---|---|---|---|---|
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? | | | | | | ✓ |
| Preservation Documented: | $Na_2S_2O_3$ Other | Trizma | None | Yes | No | NA |
| Shipping Container | Vista | Client | Retain | Return | Dispose | |

*Comments:*

*ID.:* LR – SLC *Rev No.:* 3 *Rev Date:* 05 October 2018 *Page:* 1 of 1

February 22, 2019

**Vista Work Order No. 1900218**

Mr. Scott Bourne
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, CA 94102

Dear Mr. Bourne,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on February 01, 2019 under your Project Name '101-003, Task 1'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

**Vista Work Order No. 1900218**
**Case Narrative**

**Sample Condition on Receipt:**

One water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

**Analytical Notes:**

**<u>EPA Method 1699</u>**

The sample was extracted and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

<u>Holding Times</u>

The sample was extracted and analyzed within the method hold times.

<u>Quality Control</u>

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside the method acceptance criteria are listed in the table below:

QC Anomalies

| LabNumber | SampleName | Analysis | Analyte | Flag | %Rec |
|---|---|---|---|---|---|
| 1900218-01 | TS2-I-190131 | EPA Method 1699 | 13C10-cis-Nonachlor | H | 27.9 |
| 1900218-01 | TS2-I-190131 | EPA Method 1699 | 13C12-Endrin Ketone | H | 14.0 |

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

# Sample Inventory Report

| Vista Sample ID | Client Sample ID | Sampled | Received | Components/Containers |
|---|---|---|---|---|
| 1900218-01 | TS2-I-190131 | 31-Jan-19 08:25 | 01-Feb-19 07:50 | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |
| | | | | Amber Glass NM Bottle, 1L |

Vista Project: 1900218 Client Project: 101-003, Task 1

# ANALYTICAL RESULTS

## Sample ID: Method Blank — EPA Method 1699

| | | | |
|---|---|---|---|
| Matrix: Aqueous | QC Batch: B9B0017 | Lab Sample: B9B0017-BLK1 | |
| Sample Size: 1.00 L | Date Extracted: 04-Feb-2019 8:41 | Date Analyzed: 05-Feb-19 16:55 | Column: ZB-50 |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 4.77 | | | J |
| alpha-BHC | ND | 3.61 | | |
| Lindane (gamma-BHC) | ND | 4.38 | | |
| beta-BHC | ND | 4.69 | | |
| delta-BHC | ND | 3.53 | | |
| Heptachlor | ND | 3.37 | | |
| Aldrin | ND | 3.69 | | |
| Oxychlordane | ND | 14.1 | | |
| cis-Heptachlor Epoxide | ND | 9.00 | | |
| trans-Heptachlor Epoxide | ND | 23.3 | | |
| trans-Chlordane (gamma) | ND | 12.7 | | |
| trans-Nonachlor | ND | 12.1 | | |
| cis-Chlordane (alpha) | ND | 12.2 | | |
| Endosulfan I (alpha) | ND | 16.0 | | |
| 2,4'-DDE | ND | 3.22 | | |
| 4,4'-DDE | ND | 3.60 | | |
| Dieldrin | ND | 2.53 | | |
| Endrin | ND | 3.53 | | |
| cis-Nonachlor | ND | 5.23 | | |
| Endosulfan II (beta) | ND | 7.06 | | |
| 2,4'-DDD | ND | 6.02 | | |
| 2,4'-DDT | ND | 11.1 | | |
| 4,4'-DDD | ND | 6.63 | | |
| 4,4'-DDT | ND | 10.5 | | |
| Endosulfan Sulfate | ND | 10.6 | | |
| 4,4'-Methoxychlor | ND | 2.79 | | |
| Mirex | ND | 2.85 | | |
| Endrin Aldehyde | ND | 5.09 | | |
| Endrin Ketone | ND | 7.35 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 61.4 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 79.8 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 86.3 | 11 - 120 | |
| IS | 13C6-beta-BHC | 83.2 | 32 - 130 | |
| IS | 13C6-delta-BHC | 86.3 | 36 - 137 | |
| IS | 13C10-Heptachlor | 83.7 | 5 - 120 | |
| IS | 13C12-Aldrin | 82.2 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 94.1 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 96.0 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 89.2 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 89.6 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 90.5 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 108 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 113 | 47 - 160 | |
| IS | 13C12-Dieldrin | 82.0 | 40 - 151 | |
| IS | 13C12-Endrin | 92.8 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 82.1 | 36 - 139 | |
| IS | 13C9-Endosulfan II (beta) | 87.0 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 93.5 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 91.7 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 90.3 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 96.2 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 93.8 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 75.8 | 5 - 120 | |
| IS | 13C10-Mirex | 79.3 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 54.4 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 72.8 | 15 - 148 | |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

**Sample ID: OPR** **EPA Method 1699**

| | | | |
|---|---|---|---|
| Matrix: Aqueous | QC Batch: B9B0017 | Lab Sample: B9B0017-BS1 | |
| Sample Size: 1.00 L | Date Extracted: 04-Feb-2019 8:41 | Date Analyzed: 05-Feb-19 14:27 | Column: ZB-50 |

| Analyte | Amt Found (pg/L) | Spike Amt | %R | Limits |
|---|---|---|---|---|
| Hexachlorobenzene | 976 | 1000 | 97.6 | 50 - 120 |
| alpha-BHC | 984 | 1000 | 98.4 | 50 - 120 |
| Lindane (gamma-BHC) | 964 | 1000 | 96.4 | 50 - 120 |
| beta-BHC | 996 | 1000 | 99.6 | 50 - 120 |
| delta-BHC | 1000 | 1000 | 100 | 50 - 120 |
| Heptachlor | 1020 | 1000 | 102 | 50 - 120 |
| Aldrin | 963 | 1000 | 96.3 | 50 - 120 |
| Oxychlordane | 988 | 1000 | 98.8 | 50 - 120 |
| cis-Heptachlor Epoxide | 1020 | 1000 | 102 | 50 - 120 |
| trans-Heptachlor Epoxide | 1050 | 1000 | 105 | 50 - 120 |
| trans-Chlordane (gamma) | 1010 | 1000 | 101 | 50 - 120 |
| trans-Nonachlor | 954 | 1000 | 95.4 | 50 - 120 |
| cis-Chlordane (alpha) | 1060 | 1000 | 106 | 50 - 120 |
| Endosulfan I (alpha) | 946 | 1000 | 94.6 | 50 - 120 |
| 2,4'-DDE | 975 | 1000 | 97.5 | 24 - 123 |
| 4,4'-DDE | 995 | 1000 | 99.5 | 50 - 120 |
| Dieldrin | 1020 | 1000 | 102 | 50 - 120 |
| Endrin | 1060 | 1000 | 106 | 50 - 120 |
| cis-Nonachlor | 1070 | 1000 | 107 | 50 - 120 |
| Endosulfan II (beta) | 959 | 1000 | 95.9 | 5 - 200 |
| 2,4'-DDD | 929 | 1000 | 92.9 | 50 - 120 |
| 2,4'-DDT | 1010 | 1000 | 101 | 50 - 120 |
| 4,4'-DDD | 975 | 1000 | 97.5 | 42 - 120 |
| 4,4'-DDT | 924 | 1000 | 92.4 | 50 - 120 |
| Endosulfan Sulfate | 947 | 1000 | 94.7 | 50 - 120 |
| 4,4'-Methoxychlor | 952 | 1000 | 95.2 | 50 - 120 |
| Mirex | 993 | 1000 | 99.3 | 50 - 120 |
| Endrin Aldehyde | 1040 | 1000 | 104 | 50 - 134 |
| Endrin Ketone | 933 | 1000 | 93.3 | 50 - 134 |

| | Labeled Standard | %R | LCL-UCL |
|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 62.0 | 5 - 120 |
| IS | 13C6-alpha-BHC | 78.3 | 17 - 141 |
| IS | 13C6-Lindane (gamma-BHC) | 86.3 | 5 - 124 |
| IS | 13C6-beta-BHC | 83.8 | 17 - 141 |
| IS | 13C6-delta-BHC | 86.3 | 16 - 150 |
| IS | 13C10-Heptachlor | 81.5 | 5 - 128 |
| IS | 13C12-Aldrin | 82.1 | 5 - 126 |
| IS | 13C10-Oxychlordane | 99.7 | 5 - 144 |
| IS | 13C10-cis-Heptachlor Epoxide | 98.5 | 8 - 146 |
| IS | 13C10-trans-Chlordane (gamma) | 95.0 | 15 - 144 |
| IS | 13C10-trans-Nonachlor | 93.7 | 13 - 149 |
| IS | 13C9-Endosulfan I (alpha) | 106 | 5 - 144 |
| IS | 13C12-2,4'-DDE | 99.8 | 26 - 169 |
| IS | 13C12-4,4'-DDE | 103 | 26 - 169 |
| IS | 13C12-Dieldrin | 87.7 | 19 - 161 |
| IS | 13C12-Endrin | 90.7 | 20 - 157 |
| IS | 13C10-cis-Nonachlor | 86.3 | 17 - 154 |
| IS | 13C9-Endosulfan II (beta) | 78.4 | 5 - 120 |
| IS | 13C12-2,4'-DDD | 89.3 | 14 - 200 |
| IS | 13C12-2,4'-DDT | 85.2 | 14 - 200 |
| IS | 13C12-4,4'-DDD | 87.2 | 14 - 200 |
| IS | 13C12-4,4'-DDT | 93.6 | 13 - 200 |
| IS | 13C9-Endosulfan Sulfate | 94.8 | 5 - 144 |
| IS | 13C12-Methoxychlor | 77.8 | 8 - 200 |
| IS | 13C10-Mirex | 82.9 | 5 - 138 |
| IS | 13C12-Endrin Aldehyde | 53.6 | 5 - 144 |
| IS | 13C12-Endrin Ketone | 71.7 | 5 - 144 |

LCL-UCL - Lower control limit - upper control limit

## Sample ID: TS2-I-190131 — EPA Method 1699

| Client Data | | Sample Data | | Laboratory Data | | | |
|---|---|---|---|---|---|---|---|
| Name: | CDIM Engineering | Matrix: | Water | Lab Sample: | 1900218-01 | Date Received: | 01-Feb-2019 7:50 |
| Project: | 101-003, Task 1 | Sample Size: | 1.01 L | QC Batch: | B9B0017 | Date Extracted: | 04-Feb-2019 8:41 |
| Date Collected: | 31-Jan-2019 8:25 | | | Date Analyzed: | 05-Feb-19 20:12 Column: ZB-50 | | |

| Analyte | Conc. (pg/L) | DL | EMPC | Qualifiers |
|---|---|---|---|---|
| Hexachlorobenzene | 1030 | | | B |
| alpha-BHC | 51.2 | | | |
| Lindane (gamma-BHC) | 56.8 | | | |
| beta-BHC | 48.6 | | | |
| delta-BHC | ND | 6.64 | | |
| Heptachlor | 16.8 | | | J |
| Aldrin | 18.2 | | | J |
| Oxychlordane | ND | 26.3 | | |
| cis-Heptachlor Epoxide | 144 | | | |
| trans-Heptachlor Epoxide | 918 | | | |
| trans-Chlordane (gamma) | 608 | | | |
| trans-Nonachlor | 319 | | | |
| cis-Chlordane (alpha) | 931 | | | |
| Endosulfan I (alpha) | ND | 41.2 | | |
| 2,4'-DDE | 269 | | | |
| 4,4'-DDE | 3830 | | | |
| Dieldrin | 1820 | | | |
| Endrin | 411 | | | |
| cis-Nonachlor | 101 | | | |
| Endosulfan II (beta) | ND | 108 | | |
| 2,4'-DDD | 1250 | | | |
| 2,4'-DDT | 1700 | | | |
| 4,4'-DDD | 2360 | | | |
| 4,4'-DDT | 4580 | | | |
| Endosulfan Sulfate | ND | 248 | | |
| 4,4'-Methoxychlor | ND | 3050 | | |
| Mirex | ND | 58.5 | | |
| Endrin Aldehyde | ND | 110 | | |
| Endrin Ketone | ND | 320 | | |

| | Labeled Standard | %R | LCL-UCL | Qualifiers |
|---|---|---|---|---|
| IS | 13C6-Hexachlorobenzene | 83.6 | 5 - 120 | |
| IS | 13C6-alpha-BHC | 85.3 | 32 - 130 | |
| IS | 13C6-Lindane (gamma-BHC) | 86.9 | 11 - 120 | |
| IS | 13C6-beta-BHC | 71.6 | 32 - 130 | |
| IS | 13C6-delta-BHC | 75.2 | 36 - 137 | |
| IS | 13C10-Heptachlor | 88.1 | 5 - 120 | |
| IS | 13C12-Aldrin | 64.6 | 5 - 120 | |
| IS | 13C10-Oxychlordane | 70.9 | 23 - 135 | |
| IS | 13C10-cis-Heptachlor Epoxide | 64.8 | 27 - 137 | |
| IS | 13C10-trans-Chlordane (gamma) | 47.5 | 21 - 132 | |
| IS | 13C10-trans-Nonachlor | 53.0 | 14 - 136 | |
| IS | 13C9-Endosulfan I (alpha) | 58.8 | 15 - 148 | |
| IS | 13C12-2,4'-DDE | 65.6 | 47 - 160 | |
| IS | 13C12-4,4'-DDE | 52.0 | 47 - 160 | |
| IS | 13C12-Dieldrin | 45.6 | 40 - 151 | |
| IS | 13C12-Endrin | 44.4 | 35 - 155 | |
| IS | 13C10-cis-Nonachlor | 27.9 | 36 - 139 | H |
| IS | 13C9-Endosulfan II (beta) | 29.2 | 5 - 122 | |
| IS | 13C12-2,4'-DDD | 48.9 | 5 - 199 | |
| IS | 13C12-2,4'-DDT | 36.1 | 5 - 199 | |
| IS | 13C12-4,4'-DDD | 28.9 | 5 - 120 | |
| IS | 13C12-4,4'-DDT | 26.4 | 5 - 120 | |
| IS | 13C9-Endosulfan Sulfate | 17.5 | 15 - 148 | |
| IS | 13C12-Methoxychlor | 15.1 | 5 - 120 | |
| IS | 13C10-Mirex | 20.9 | 5 - 120 | |
| IS | 13C12-Endrin Aldehyde | 18.4 | 15 - 148 | |
| IS | 13C12-Endrin Ketone | 14.0 | 15 - 148 | H |

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

# DATA QUALIFIERS & ABBREVIATIONS

| | |
|---|---|
| B | This compound was also detected in the method blank |
| Conc. | Concentration |
| D | Dilution |
| DL | Detection limit |
| E | The associated compound concentration exceeded the calibration range of the instrument |
| H | Recovery and/or RPD was outside laboratory acceptance limits |
| I | Chemical Interference |
| J | The amount detected is below the Reporting Limit/LOQ |
| LOD | Limits of Detection |
| LOQ | Limits of Quantitation |
| M | Estimated Maximum Possible Concentration (CA Region 2 projects only) |
| NA | Not applicable |
| ND | Not Detected |
| P | The reported concentration may include contribution from chlorinated diphenyl ether(s). |
| Q | Ion ratio outside of 70-130% of Standard Ratio. |
| TEQ | Toxic Equivalency |
| U | Not Detected (specific projects only) |
| * | See Cover Letter |

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

## Vista Analytical Laboratory Certifications

| Accrediting Authority | Certificate Number |
|---|---|
| Alaska Department of Environmental Conservation | 17-013 |
| Arkansas Department of Environmental Quality | 19-013-0 |
| California Department of Health – ELAP | 2892 |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005 | 3091.01 |
| Florida Department of Health | E87777 |
| Hawaii Department of Health | N/A |
| Louisiana Department of Environmental Quality | 01977 |
| Maine Department of Health | 2018017 |
| Michigan Department of Environmental Quality | 9932 |
| Minnesota Department of Health | 1521520 |
| New Hampshire Environmental Accreditation Program | 207718 |
| New Jersey Department of Environmental Protection | CA003 |
| New York Department of Health | 11411 |
| Oregon Laboratory Accreditation Program | 4042-010 |
| Pennsylvania Department of Environmental Protection | 015 |
| Texas Commission on Environmental Quality | T104704189-19-10 |
| Virginia Department of General Services | 9618 |
| Washington Department of Ecology | C584-18 |
| Wisconsin Department of Natural Resources | 998036160 |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

# NELAP Accredited Test Methods

| MATRIX: Air | |
|---|---|
| **Description of Test** | **Method** |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23 |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water | |
|---|---|
| **Description of Test** | **Method** |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS | EPA 522 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water | |
|---|---|
| **Description of Test** | **Method** |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Dioxin by GC/HRMS | EPA 613 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids | |
|---|---|
| **Description of Test** | **Method** |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613 |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS | EPA 1613B |
| Brominated Diphenyl Ethers by HRGC/HRMS | EPA 1614A |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS | EPA 1668A/C |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS | EPA 1699 |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537 |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS | EPA 8280A/B |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

CDIM ENGINEERING

# CHAIN OF CUSTODY RECORD

1900218 1.0°C

| LABORATORY: | INSTRUCTIONS FOR LAB PERSONNEL: | | |
|---|---|---|---|
| Vista Analytical<br>1104 Windfield Way, El Dorado Hills CA 95762<br>(916) 673-1520<br>Karen Volpendesta | Please send analytic results, electronic deliverables and the original chain-of-custody form to:<br>bas@cdimengineering.com, mec@cdimengineering.com<br>sab@cdimengineering.com | Analysis Turnaroud Time X Standard □ Other<br>GeoTracker EDF required? □ Yes X No<br>LOCUS EDD required? □ Yes X No<br>Report Results to: □ RL X MDL<br>Report soil results to: □ wet weight (total) □ dry weight | Specify analytic/prep method and detection limit in report.<br>Notify us of any anomalous peaks in GC or other scans.<br>Call immediately with any questions or problems. |

**CDIM CONTACT:**
CDIM Engineering
45 Polk Street, 3rd Floor
San Francisco, California 94102

**Project Manager:** Bryan Starks
**Phone Number** 415-498-0535
**Sampled by:**
**Sample date(s):**

**PROJECT INFORMATION**

**Job Name:** LRTC 2018-2019 Industrial Stormwater
**Job #:** 101-003, Task 1
**Address:** 402 Wright Avenue, Richmond CA 94804

ANALYSIS REQUESTED

COC Number:

Page 1 of 1

SDG number:

| Lab ID | Sample Identification | Sample Date | Sample Time | Sample Matrix | # of Cont. | Pesticides (EPA 1699) | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|
| | TS2-I-190130 | 1/30/2019 | 825 | W | 3 | X | Composite |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| **Field Filtered (X):** | | | | | | | |
| Preservation Used: 1= Ice, 2= HCl; 3= $H_2SO_4$; 4=$HNO_3$; 5=NaOH; 6= Other | | | | | | 1 | |

**Special Instructions/QC Requirements & Comments:** **Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.**

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| [signature] □ | CDIM | 1/31/19 1230 | Kim Eric ○ | VAL | 2/1/19 0750 |
| □ | | | ○ | | |
| □ | | | ○ | | |

x = Samples released to a secured, locked area. ● = Samples received from a secured, locked area

| SAMPLERS NAME | Bryan Starks | MOBILE # | 808 256 9230 |
|---|---|---|---|
| SAMPLERS SIGNATURE | [signature] | DATE / TIME | 1/31/19 1015 |

Vista Analytical Laboratory

# Sample Log-In Checklist

Vista Work Order #: 1900218 Page # 1 of 1

TAT Std

| | | | |
|---|---|---|---|
| Samples Arrival: | Date/Time 2/1/19 0750 | Initials: KE | Location: WR-2 Shelf/Rack: NA |
| Logged In: | Date/Time 2/1/19 0827 | Initials: KE | Location: WR-2 Shelf/Rack: B2 |

| Delivered By: | FedEx | UPS | On Trac | GSO | DHL | Hand Delivered | Other |
|---|---|---|---|---|---|---|---|

| Preservation: | Ice | Blue Ice | Dry Ice | None |
|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Temp °C: 1.1 (uncorrected) | Probe used: Y / N | Thermometer ID: IR4 |
| Temp °C: 1.0 (corrected) | | |

| | YES | NO | NA |
|---|---|---|---|
| Adequate Sample Volume Received? | ✓ | | |
| Holding Time Acceptable? | ✓ | | |
| Shipping Container(s) Intact? | ✓ | | |
| Shipping Custody Seals Intact? | | | ✓ |
| Shipping Documentation Present? | ✓ | | |
| Airbill F.O. Trk # 7852 5050 5357 | ✓ | | |
| Sample Container Intact? | ✓ | | |
| Sample Custody Seals Intact? | | | ✓ |
| Chain of Custody / Sample Documentation Present? | ✓ | | |
| COC Anomaly/Sample Acceptance Form completed? | | ✓ | ✓ |

| | | | | |
|---|---|---|---|---|
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? | | | | ✓ |
| Preservation Documented: | $Na_2S_2O_3$ Trizma None Other | Yes | No | NA |
| Shipping Container | Vista Client Retain | Return | Dispose | |

*Comments:*

# APPENDIX C

Upland Capping System Inspection Form

# Former United Heckathorn Superfund Site Upland Capping System Inspection Form
## Levin Richmond Terminal, 402 Wright Avenue, Richmond, California

## I. General Information

**Site:** Former United Heckathorn Superfund Site, Levin Richmond Terminal
**Address:** 402 Wright Avenue, Richmond, CA

**Inspector:** Bryan Starks and Scott Bourne, PE
**Organization:** CDIM
**Date and time of inspection:** 5/29/19 1:00pm

## II. Upland Area Concrete Cap, Gravel Cover, and Drainage System Observations

*Note significant cracks, holes, penetrations, damage, settlement, or any exposure of underlying soil in any component of the capping system.*

### North Main Terminal (SW-3)

| | Yes | No | N/A | Comments |
|---|---|---|---|---|
| Are concrete cap surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Are gravel cover surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff? | X | | | |
| Is accumulated sediment observed in the interceptors or drain inlets? If yes, note location and photograph. | | | X | *Interceptors not accessed during this inspection. Drain inlets have inlet protection.* |
| Are corrective actions required? | | X | | |
| Attach a photograph of areas requiring corrective action. | | | X | |

Describe any recent repairs/maintenance:

*All interceptors in the Upland area were cleaned prior to the 2018-2019 wet season. This is performed annually during dry weather and as-needed throughout the storm season.*

*Drain inlets equipped with drain inlet filters, which are observed during regular BMP inspections.  Drain inlets are replaced as needed throughout the storm season and at least once per year prior to the start of the storm season.*

*Deteriorated concrete west of Interceptor 3 was repaired and a new storm drain was installed to reduce ponding in the area. New curbing was added along the west border of the site to preven water from running off site.*

Describe conditions and locations of the capping system which require attention:

*Small cracks noted in the bulk product storage area. No soil was exposed in the area, but the area should continue to be monitored.*

Describe corrective actions required and their date(s) of implementation:

*None.*

Signature:

Date: 5/29/2019

## Former United Heckathorn Superfund Site Upland Capping System Inspection Form
## Levin Richmond Terminal, 402 Wright Avenue, Richmond, California

**North Main Terminal/United Heckathorn (SW-4)**

| | Yes | No | N/A | Comments |
|---|---|---|---|---|
| Are concrete cap surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Are gravel cover surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff? | X | | | |
| Is accumulated sediment observed in the interceptors or drain inlets? If yes, note location and photograph. | | | X | *Interceptors not accessed during this inspection. Drain inlets have inlet protection.* |
| Are corrective actions required? | | X | | |
| Attach a photograph of areas requiring corrective action. | | | X | |

Describe any recent repairs/maintenance:

*None*

Describe conditions and locations of the capping system which require attention:

*Minor surficial cracking was noted in the bulk product storage area. Continue to monitor.*

Describe corrective actions required and their date(s) of implementation:

*None.*

Signature:

Date: 5/29/2019

## Former United Heckathorn Superfund Site Upland Capping System Inspection Form
## Levin Richmond Terminal, 402 Wright Avenue, Richmond, California

**North Main Terminal/United Heckathorn (SW-5)**

| | Yes | No | N/A | Comments |
|---|---|---|---|---|
| Are concrete cap surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Are gravel cover surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff? | X | | | |
| Is accumulated sediment observed in the interceptors or drain inlets? If yes, note location and photograph. | | | X | *Interceptors not accessed during this inspection. Drain inlets have inlet protection.* |
| Are corrective actions required? | | X | | |
| Attach a photograph of areas requiring corrective action. | | | X | |

Describe any recent repairs/maintenance:

*Repair performed for cracking at railroad crossing.*

Describe conditions and locations of the capping system which require attention:

*None.*

*Gravel cover should continue to be monitored, and additional gravel placed as needed.*

Describe corrective actions required and their date(s) of implementation:

*None.*

Signature:

Date: 5/29/2019

## Former United Heckathorn Superfund Site Upland Capping System Inspection Form
## Levin Richmond Terminal, 402 Wright Avenue, Richmond, California

**North Main Terminal/United Heckathorn (SW-6)**

| | Yes | No | N/A | Comments |
|---|---|---|---|---|
| Are concrete cap surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Are gravel cover surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff? | X | | | |
| Is accumulated sediment observed in the interceptors or drain inlets? If yes, note location and photograph. | | | X | *Interceptors not accessed during this inspection. Drain inlets have inlet protection.* |
| Are corrective actions required? | | X | | |
| Attach a photograph of areas requiring corrective action. | | | X | |

Describe any recent repairs/maintenance:

*None.*

Describe conditions and locations of the capping system which require attention:

*Minor surficial cracks and seams were noted north of interceptor #5 and treatment system TS-2. Gravel cover should continue to be monitored, and additional gravel placed as needed.*

Describe corrective actions required and their date(s) of implementation:

*None.*

Signature:

Date: 5/29/2019

**Former United Heckathorn Superfund Site Upland Capping System Inspection Form**
**Levin Richmond Terminal, 402 Wright Avenue, Richmond, California**

**North Main Terminal/United Heckathorn (SW-7)**

| | Yes | No | N/A | Comments |
|---|---|---|---|---|
| Are concrete cap surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Are gravel cover surfaces in adequate condition to promote effectiveness of the cap? | X | | | |
| Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff? | X | | | |
| Is accumulated sediment observed in the interceptors or drain inlets? If yes, note location and photograph. | | | X | *Interceptors not accessed during this inspection. Drain inlets have inlet protection.* |
| Are corrective actions required? | | X | | |
| Attach a photograph of areas requiring corrective action. | | | X | |

Describe any recent repairs/maintenance:

*None.*

Describe conditions and locations of the capping system which require attention:

*Minor surfical cracks and seams observed throughout SW-7. Gravel cover should continue to be monitored, and additional gravel placed as needed.*

Describe corrective actions required and their date(s) of implementation:

*None.*

Signature:

Date: 5/29/2019